A Socioeconomic Atlas for

Big Thicket National Preserve and its Region

2004

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by

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Acknowledgments

We would like to express our appreciation to the staff of Big Thicket National Preserve for their enthusiasm and interest throughout this project, especially Superintendent Art Hutchinson and Chuck Hunt, Natural Resource Specialist. We are also grateful to Intermountain Regional Director Steve Martin, Deputy Regional Director Mike Snyder, and Wayne Gardner, Chief of Planning and Environmental Quality, for their commitment. Funding from the National Park Service (NPS) Social Science Program and the NPS Recreational Fee Demonstration Program supported this project. In addition, the Peter R. Gould Center for Geography Education and Outreach at the Pennsylvania State University generously supported this project with systems administration and facilities.

About this Atlas

This atlas is one in a developing National Park Service atlas series. The purpose of the atlas series is to show socioeconomic trends for regions around individual national park units. Pilot atlases were completed for Harpers Ferry National Historical Park, Joshua Tree National Park, Mount Rainier National Park, and Wilson's Creek National Battlefield. The potential to link these atlases to park planning, e.g., updating the General Management Plan, is being explored with a second series of atlases that began with the Blue Ridge Parkway.

After NPS produced the Blue Ridge Parkway atlas, atlases in the second series have been created in collaboration with the Department of Geography at the Pennsylvania State University. Big Thicket National Preserve is one of the atlases in the second series. For more information about the atlas series, contact Jean McKendry, National Park Service, 1849 C Street NW (3130), Washington, DC 20240 (jean_mckendry@partner.nps.gov).

About the Authors

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Preface

Protection of the National Park System requires active and scientifically informed management. If park resources – both natural and cultural – are to be protected for future generations, the NPS must develop efficient ways to monitor the condition and trends of natural and human systems. Such monitoring must provide usable knowledge that managers can apply to the preservation of resources. And the NPS must share this information with surrounding communities, stakeholders, and partners to help them make important choices about their future.

Because of these reasons and more, the NPS has embarked on a significant initiative – the Natural Resource Challenge, an action plan for preserving natural resources and our country's natural heritage within the complexities of modern landscapes (http://www1.nature.nps.gov/challenge/index.htm).

This atlas is one component in that effort. It is a tool for park managers, planners, community leaders, and others to use in addressing the challenge of preserving the natural and cultural resources of Big Thicket National Preserve. Part of that challenge involves understanding conditions outside park boundaries – conditions which can have significant impacts on park resources. Systematic study and monitoring of regional conditions involves, to a large degree, investigation of human activities. This atlas focuses on such human activities, characterizing them in terms of standardized measures known as socioeconomic indicators.

The atlas can currently serve as an aid to management and planning, as a training tool, and as a means to facilitate public participation. It can be of long-term benefit by establishing baseline data for monitoring changing conditions and trends in the region. Through these and other potential uses, the atlas supports the critical goal of improving park management through a greater reliance on usable scientific knowledge, and contributes to meeting the Natural Resource Challenge.

Gary E. Machlis
Visiting Senior Scientist
National Park Service

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Introduction

The purpose of this atlas is to provide park managers, planners, community leaders, and others with a better understanding of changing human activities and socioeconomic conditions in the region surrounding Big Thicket National Preserve. These changes outside a park's boundaries can create complex park management challenges. Information about regional trends and conditions is needed in order to manage and conserve park resources – both natural and cultural – more effectively. This atlas provides such information in a series of maps, complemented by tables, other graphics, and explanatory text.

Maps are effective ways of conveying information. A map can highlight geographical patterns in data by showing the relationship between what is happening and where it is happening. For example, a map that shows a park's road network and also shows the locations of traffic accidents may indicate that certain sections of park roadway are particularly hazardous. Or a map that plots where park visitors come from might show that the park is popular with residents from a particular part of the region or the nation.

The maps in this atlas combine *contextual* information (such as boundary lines, roads, and key towns) with *thematic* information (such as demographic or economic statistics). This combination of contextual and thematic information helps the reader observe general trends inherent in the distribution of data. For example, a map that shows the population growth rate for each county in the park region may reveal that all of the highest growth rates are concentrated in counties south of the park.

Each map is designed to allow for easy comparison, so readers can see how conditions and trends in their own counties compare with those in other counties and relate to larger regional patterns. The consistent map design allows readers to make useful comparisons among two or more maps. For example, comparing maps of federal expenditures per person and poverty rates might reveal that federal expenditures tend to be higher in a region's poorer counties.

There are many potential uses for this atlas. For example, park managers can share the atlas with new park staff, regional staff, the media, or policy makers as a way of orienting them to the basic facts about the region. Planners can use the atlas to examine emerging trends outside the park and to prioritize actions to mitigate any anticipated adverse impacts on park resources. Local and regional leaders can consult the atlas to develop environmental policies that support park management goals while remaining responsive to local needs. Researchers can use the atlas to design studies that have practical benefit to park and ecosystem management. Additional uses are discussed in the atlas' concluding section, pages 76 - 77. Regardless of how it is used, the atlas can serve as a useful reference tool that adds to the body of usable scientific knowledge about Big Thicket National Preserve and its surrounding region.

Socioeconomic Indicators: Valuable Management Tools

The Relevance of Human Activities to Park Resource Management

The management of park resources always requires attention to human behavior and activities. Protection of a threatened archaeological site can mean educating visitors about the Antiquities Act. Controlling non-native plant species can require close collaboration with park neighbors and volunteers. Preservation of scenic values can depend upon the monitoring of emissions from electrical generation plants several states away.

While there is an on-going and healthy debate about how to address this "human factor" in park management, a consensus has emerged about three basic principles:

- people are part of park ecosystems, and their needs and activities must be considered in management plans;
- park managers should be concerned with short and long-term trends, as well as the local, regional, and national consequences of actions; and
- where appropriate, decisions about park resources should be made collaboratively, including federal agencies, local governments, and citizens in the process.

Managing parks in accordance with these principles requires careful planning, for people have many competing needs.

Careful planning requires an accurate and objective assessment of current conditions as well as on-going trends. Hence, understanding the social, cultural, and economic characteristics of the park region is crucial for successful park management.

The Value of Socioeconomic Indicators

One approach to understanding social, cultural, and economic conditions and trends is to use *socioeconomic indicators*. Socioeconomic indicators are regularly collected economic or social statistics that describe or predict changes and trends in the general state of society. For example, the consumer price index (CPI) keeps track of changes in the price of a typical group of consumer goods. The CPI is used to monitor inflation, to compare the cost-of-living in one region of the country to another, and to support economic policy-making. Socioeconomic indicators can address historical trends, present conditions, or future projections.

An integrated set of socioeconomic indicators can be effective in presenting the "basic facts" about the people of a region. Such basic facts are important to park management, and can be used in many ways: assessing the potential impact of government policies, developing sound resource management strategies, designing effective interpretive programs, increasing public involvement in the planning process, and so forth. Like measures of water quality or wildlife populations, socioeconomic indicators enable managers and citizens to make scientifically informed decisions concerning public resources.

The Integrated Set of Indicators

The indicators in this atlas are not simply a collection of various statistics displayed in maps, but an integrated set of indicators organized around broad areas of human activity that are of particular relevance to park management. The selection of a broad range of relevant indicators is important because the dynamics of human interaction on a regional scale are complex. For example, the growth of a new industry can influence a rise in immigration, which in turn can influence other human activities such as housing development. While industry, immigration, and housing are categorically different indicators, each one could be important for a park manager trying to anticipate growth issues that might impact park visitation or ecological systems.

The integrated set of indicators displayed in this atlas encompasses six general categories:

- *General population* indicators measure how many people live in a given area, where those people are concentrated, their ages, patterns of migration, and so forth. General population indicators provide a profile of the people who are neighbors to the park and potential partners in park management.

- *Economy and commerce* indicators measure the flow and distribution of money, materials, and labor. Economy and commerce indicators provide an overview of the interdependent economic relationships among people, businesses, industries, and government within the park region.

- *Social and cultural* indicators measure aspects of personal and group identity such as cultural origin, political and religious beliefs, health, and language. Social and cultural indicators provide insights into the varying perceptions and expectations that people bring with them when they go to their place of work, participate in a public meeting, or visit a park interpretive site.

- *Recreation and tourism* indicators measure activities specifically related to the provision of accommodations, entertainment, and personal services. Recreation and tourism indicators provide a way to analyze the economic role that travelers, vacationers, and other recreationists play in the region surrounding the park, which is itself closely linked to the recreation/tourism sector.

- *Administration and government* indicators measure the structure, resources, and actions of government organizations. Administration and government indicators provide an orientation to the role of government – local, state, and federal – in the park region.

- *Land use* indicators measure the interactions between people and terrestrial resources such as land, water supply, and vegetation. Land use indicators provide a way to gauge the impact of human activities such as farming, forestry, and urban development upon ecosystems within the park region.

Selecting Specific Indicators

Drawing from the six general categories of socioeconomic indicators described above, a menu of 67 socioeconomic indicators was developed. Each indicator was determined to be readily available and mappable at the county level. From this menu, 17 *core indicators* were selected that would be common to all atlases published in this series. The core indicators provide information useful to all park managers. Incorporating these core indicators throughout the series of atlases enables park managers to make comparisons among parks in different regions of the country. Big Thicket National Preserve staff chose additional indicators from the menu described above. Park staff selected these indicators to customize the atlas so that it would target information relevant to their particular management needs. Figure 1 shows the six general categories and the specific indicators included in this atlas; for each category, indicators are listed in the order they appear in the atlas.

The maps in this atlas are based on county-level data wherever possible. County-level data have several advantages. Good quality data are available at this scale, consistently collected at regular intervals, and comparable across all U.S. counties. Also, counties are stable geographic units for monitoring trends, as little change in county boundaries occurs over time. Finally, as administrative and political units, counties significantly influence environmental change and can be important partners in park management.

Technical Notes

Appendix 1 provides the data sources for the indicators presented in this atlas. Appendix 2 provides technical information on the design of the maps. Appendix 3 includes endnotes and text that provide additional information on the measurement of selected indicators.

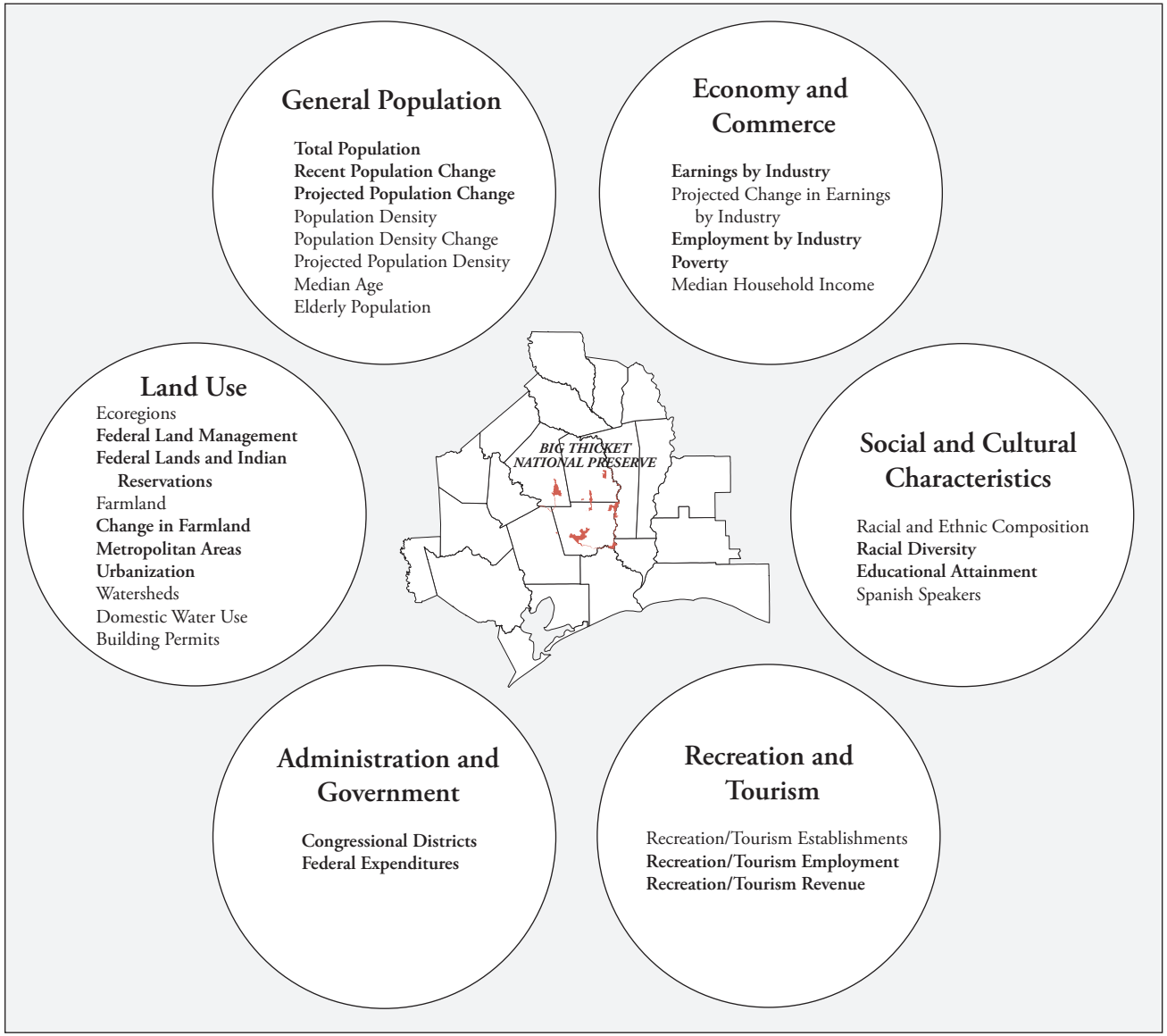


Figure 1. Indicators Included in this Atlas

core indicator additional indicator

The Region

In selecting the boundaries of the region of interest covered by this atlas, Big Thicket National Preserve (NPRES) staff were asked to define the geographic area that has the most significant impact on the preserve's management. Because the atlas relies on county-level socioeconomic data, the region of interest was restricted to entire counties, rather than parts of counties. The region selected includes 20 counties in eastern Texas and three counties in southwest Louisiana. The map on the facing page depicts the region in its larger context.

Big Thicket NPRES comprises numerous land and water units, totaling over 150 square miles. The Preserve units are situated in seven counties north of Beaumont, Texas. These units are: Beech Creek, Upper Neches River Corridor, Neches Bottom and Jack Gore Baygall Unit, Lower Neches River Corridor, Beaumont, Pine Island-Little Pine Island Bayou Corridor, Lance Rosier Unit, Loblolly, Turkey Creek, Hickory Creek Savannah, Menard Creek Corridor, and Big Sandy Creek. The Preserve is located approximately 100 miles northeast of Houston, Texas and 200 miles south-southeast of Shreveport, Louisiana.

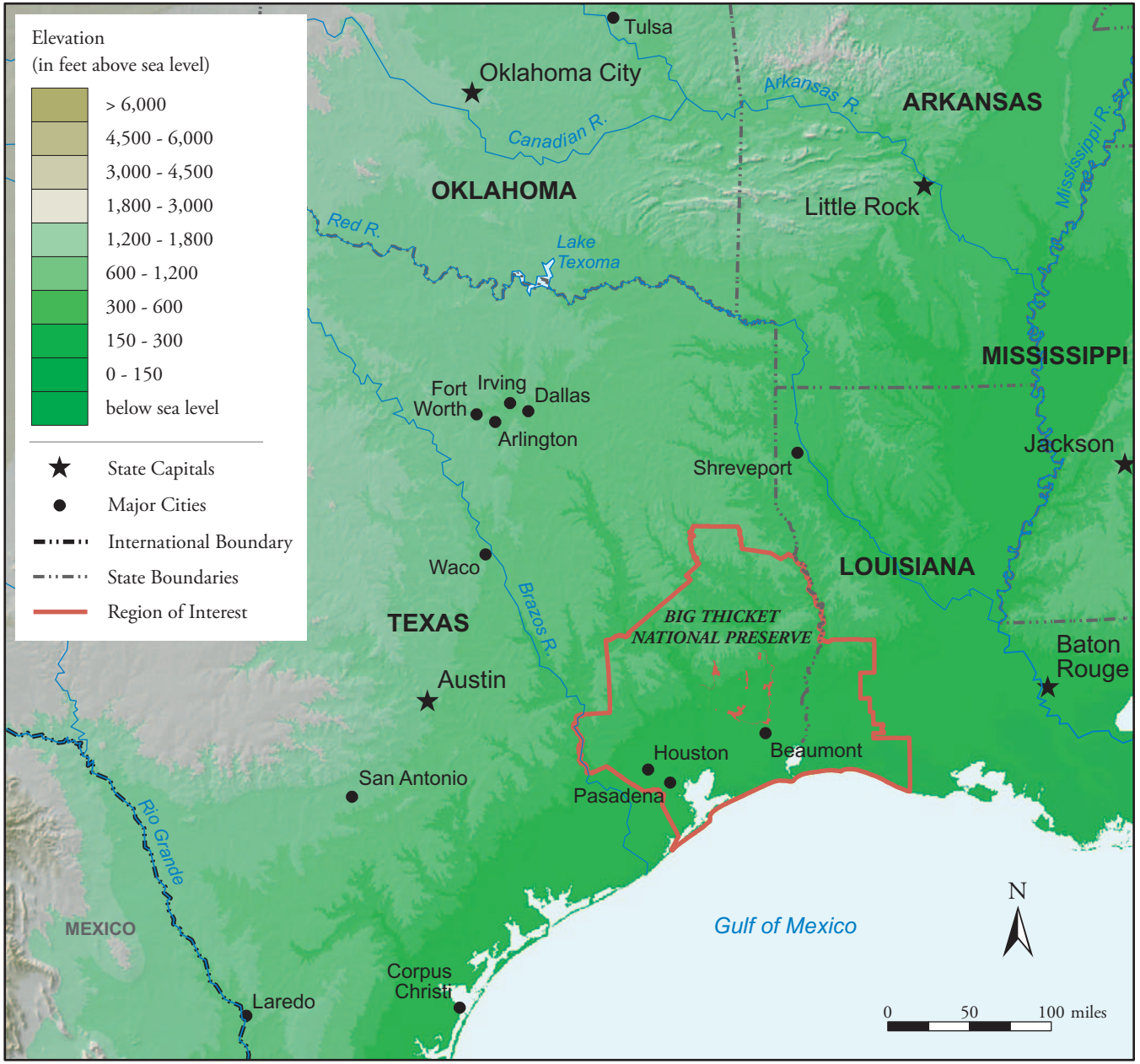
Big Thicket NPRES is characterized by a rich diversity of species and ecosystems. The Preserve protects the remnants of a unique ecological system established in the transition zone between backwater swamps, eastern deciduous forests, central plains, pine savannas, and dry sandhills. Successive glacial periods pushed these different ecological systems together as they advanced and retreated, creating a zone of unusual combinations of plants and animals with habitat for rare species. In recognition of this area's biological importance it has been designated a Globally Important Birding Area and an International Biosphere Reserve.

The region was once part of the homeland of the Nacogdoches Indians. French and Spanish explorers surveyed the area during the 16th, 17th, and 18th centuries, setting up trading posts and missions. Native Americans migrated to the region during the late 18th century. The Alabama-Coushatta Tribe remained in southeast Texas and now live on a reservation in Polk County. Recent population growth in the area is greater than the national average; between 1990 and 2000 over half the counties in the region experienced population growth rates greater than that of the nation as a whole. White people, many of Hispanic or Latino descent, dominate today's population. There are sizeable numbers of people of African American and Asian descent as well.

Houston, the fourth largest city in the country and the largest in Texas, plays a major economic role in the region. The oil and gas industry dominates the economy of the region. Other large industries include medical research, led by the Texas Medical Center in Houston, construction, and engineering. Logging and agriculture are still important in some areas. More recently, computer manufacturing has become a significant economic factor in the area.

Big Thicket NPRES is the only national park unit in this region.

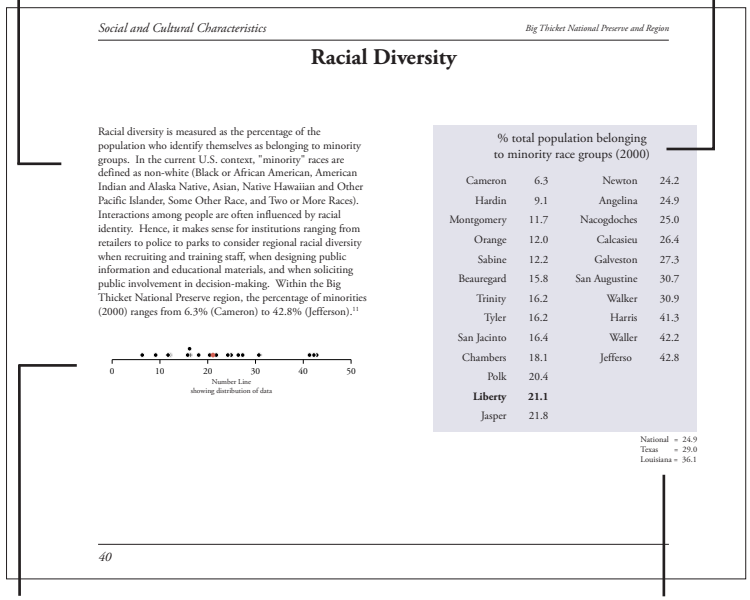
Big Thicket National Preserve and its Region



Using the Socioeconomic Indicators and Maps

The socioeconomic indicators for the Big Thicket National Preserve region of interest are presented in a series of maps. The best available county-level data are presented for each indicator. The following information is provided for each indicator:

- a brief description of the socioeconomic indicator and an observation about the spatial variation in the data as displayed on the map.
- a table that shows the data and relative rank for each county. The median value is highlighted in bold. The table allows the reader to look up and compare specific indicator values for each county.
- a map legend describing how the indicator is measured, the year that the data were gathered, and the range of values for each quartile grouping.
- the name of the general category to which this particular indicator belongs (such as general population or land use). Maps in the same general category share similar sets of color symbols.



Social and Cultural Characteristics *Big Thicket National Preserve and Region*

Racial Diversity

Racial diversity is measured as the percentage of the population who identify themselves as belonging to minority groups. In the current U.S. context, "minority" races are defined as non-white (Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races). Interactions among people are often influenced by racial identity. Hence, it makes sense for institutions ranging from retailers to police to parks to consider regional racial diversity when recruiting and training staff, when designing public information and educational materials, and when soliciting public involvement in decision-making. Within the Big Thicket National Preserve region, the percentage of minorities (2000) ranges from 6.3% (Cameron) to 42.8% (Jefferson).[11]

0 10 20 30 40 50

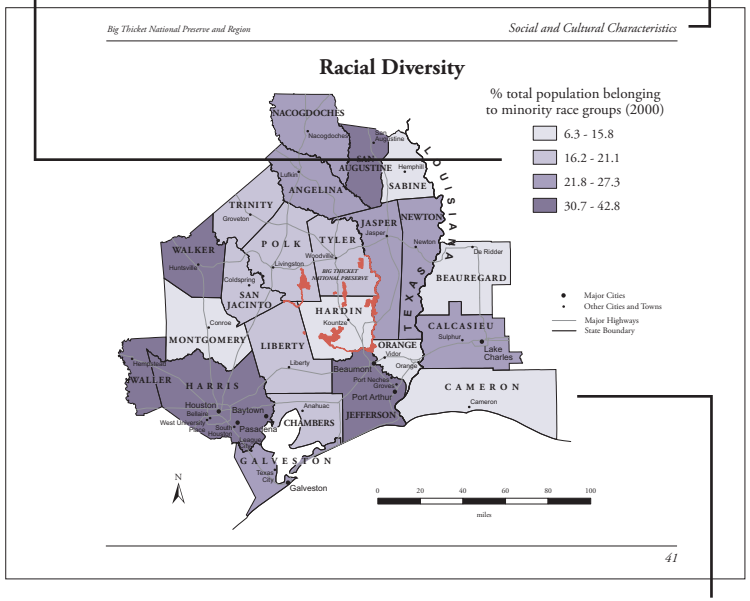
Number Line showing distribution of data

% total population belonging to minority race groups (2000)

Cameron	6.3	Newton	24.2
Hardin	9.1	Angelina	24.9
Montgomery	11.7	Nacogdoches	25.0
Orange	12.0	Calcasieu	26.4
Sabine	12.2	Galveston	27.3
Beauregard	15.8	San Augustine	30.7
Trinity	16.2	Walker	30.9
Tyler	16.2	Harris	41.3
San Jacinto	16.4	Waller	42.2
Chambers	18.1	Jefferso	42.8
Polk	20.4		
Liberty	**21.1**		
Jasper	21.8		

National = 24.9
Texas = 29.0
Louisiana = 36.1

40



Big Thicket National Preserve and Region *Social and Cultural Characteristics*

Racial Diversity

% total population belonging to minority race groups (2000)

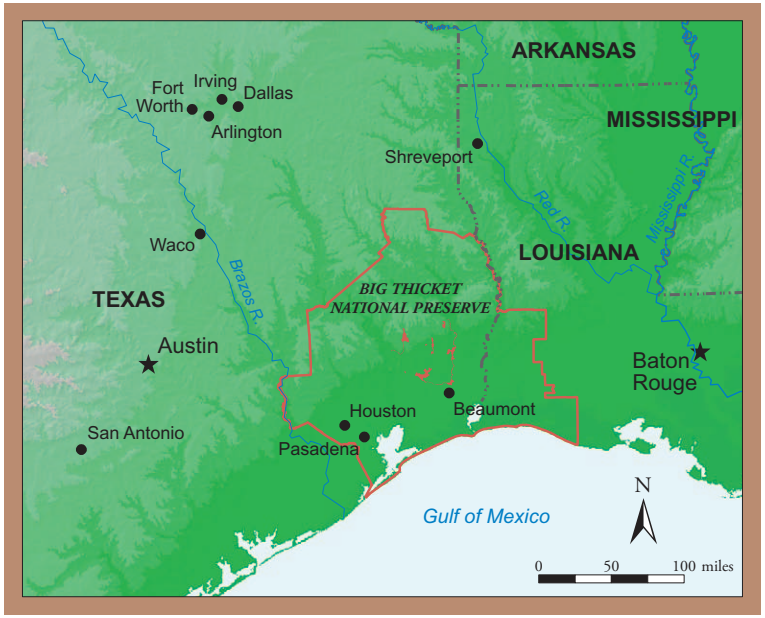
6.3 - 15.8
16.2 - 21.1
21.8 - 27.3
30.7 - 42.8

NACOGDOCHES
SAN AUGUSTINE
ANGELINA
SABINE
TRINITY
JASPER
NEWTON
POLK
TYLER
WALKER
BEAUREGARD
SAN JACINTO
HARDIN
CALCASIEU
MONTGOMERY
LIBERTY
ORANGE
WALLER
HARRIS
CAMERON
JEFFERSON
CHAMBERS
GALVESTON
LOUISIANA
TEXAS
BIG THICKET NATIONAL PRESERVE
Major Cities
Other Cities and Towns
Major Highways
State Boundary
N
0 20 40 60 80 100
miles

41

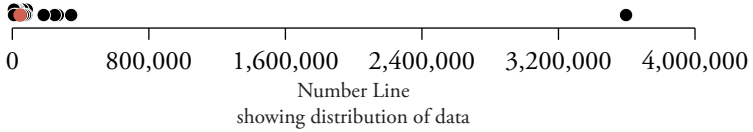
- a number line that shows the distribution of values for the indicator, useful in understanding patterns in the data. The median value is represented by a **red** dot.
- a section displaying national and state data that can be compared with regional county data.
- a map that displays general patterns inherent in the data. For most indicators, counties are grouped into four classes that correspond to four sub-ranges of data values. These groups are called quartiles. The highest-ranked quartile receives the darkest shading. For more information on quartile classification, see Appendix 2, page 83.

The Socioeconomic Indicators



Total Population

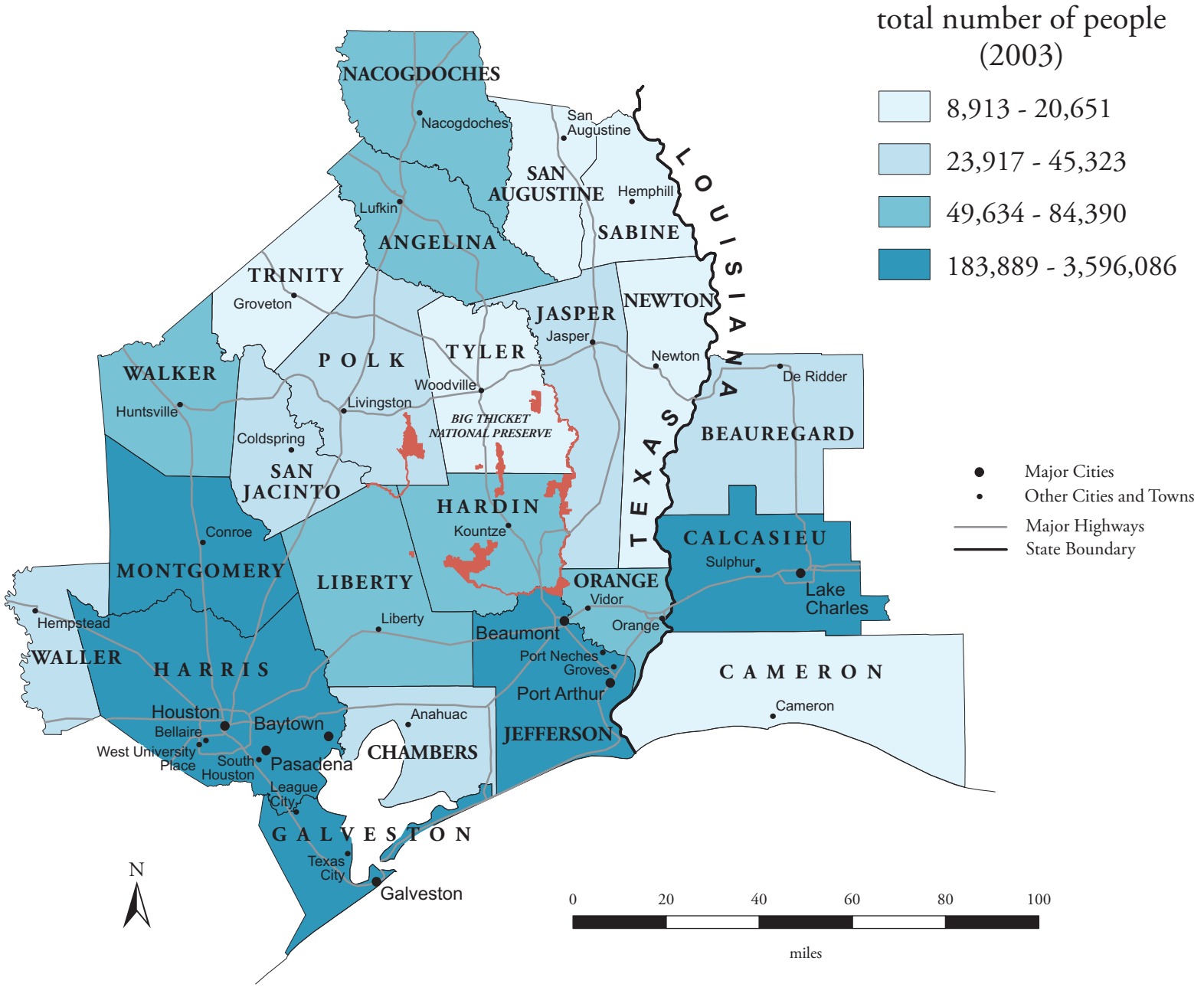
Population size is one of the most important influences on the character of human activities in a place and a key influence on resource use. People bring labor, knowledge, and economic activity to a place. At the same time, they generate demand for natural resources, goods, and services ranging from food to recreational opportunities. Within the Big Thicket National Preserve region, county population (2003) ranges from 8,913 (San Augustine) to 3,596,086 (Harris).[1]



	total number of people (2003)		
San Augustine	8,913	Nacogdoches	59,584
Cameron	9,708	Walker	62,038
Sabine	10,379	Liberty	74,117
Trinity	14,151	Angelina	80,935
Newton	14,869	Orange	84,390
Tyler	20,651	Calcasieu	183,889
San Jacinto	23,917	Jefferson	248,605
Chambers	27,581	Galveston	266,775
Beauregard	33,514	Montgomery	344,700
Waller	34,579	Harris	3,596,086
Jasper	35,509		
Polk	**45,323**		
Hardin	49,634		

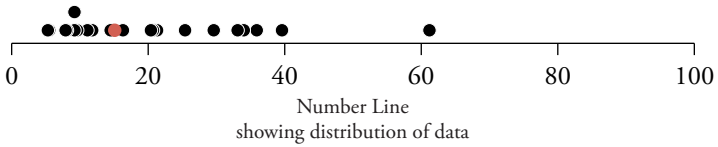
National = 290,809,777
Texas = 22,118,509
Louisiana = 4,496,334

Total Population



Recent Population Change

Measuring recent population change provides an indication of the extent to which population change is influencing current local or regional priorities. For example, population growth changes the tax base, adds new voters, and can increase demand for services ranging from schools to transportation to outdoor recreation. Within the Big Thicket National Preserve region, the recent increase in county population (1990 - 2000) ranges from 5.3% (Jefferson) to 61.2% (Montgomery).

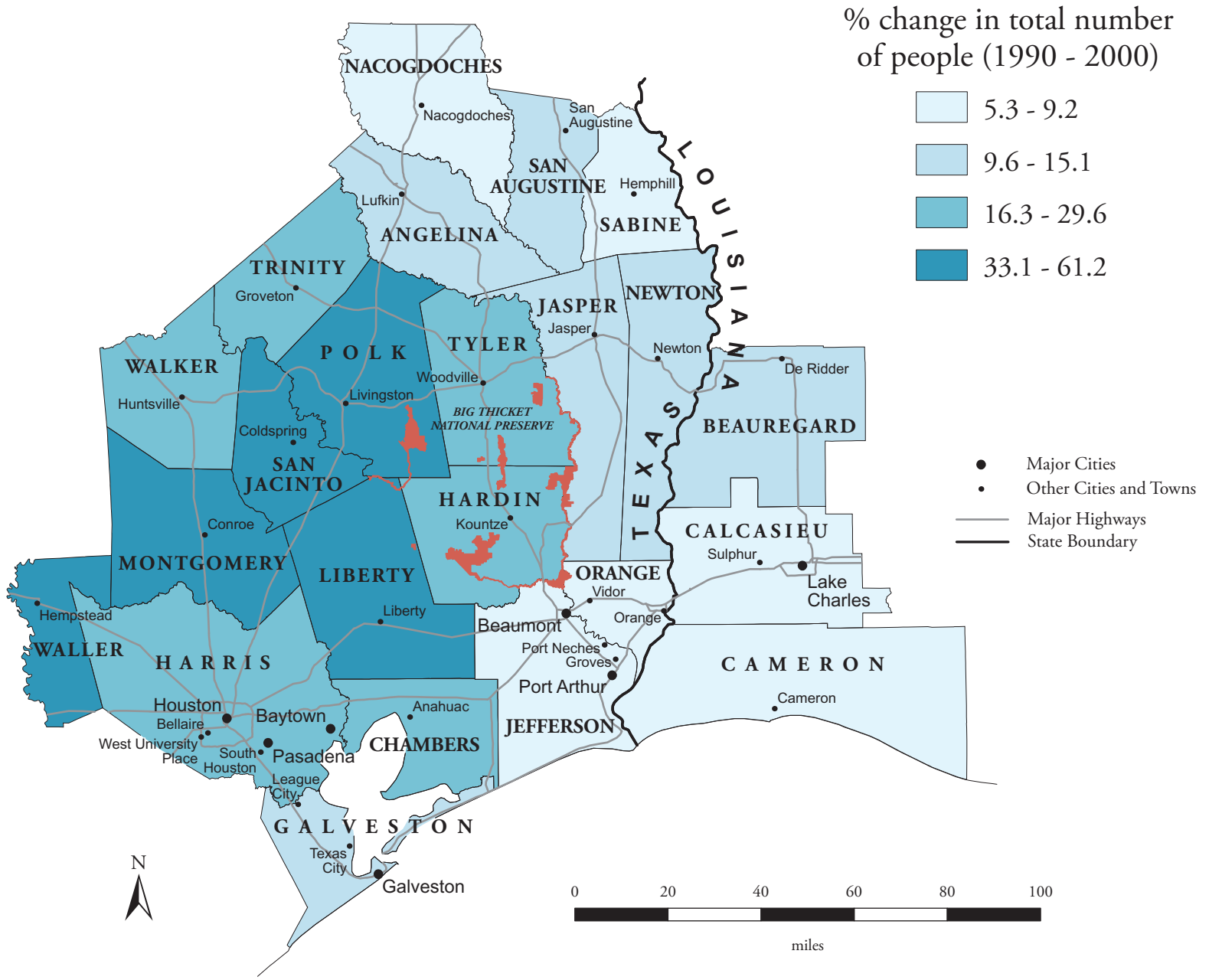


Number Line
showing distribution of data

	% change in total number of people (1990 - 2000)		
Jefferson	5.3	Trinity	20.4
Orange	5.5	Harris	20.7
Cameron	7.9	Walker	21.3
Nacogdoches	8.1	Tyler	25.4
Calcasieu	9.2	Chambers	29.6
Sabine	9.2	Liberty	33.1
Beauregard	9.6	Polk	34.0
Newton	11.1	San Jacinto	35.9
San Augustine	11.8	Waller	39.6
Jasper	14.5	Montgomery	61.2
Angelina	14.7		
Galveston	**15.1**		
Hardin	16.3		

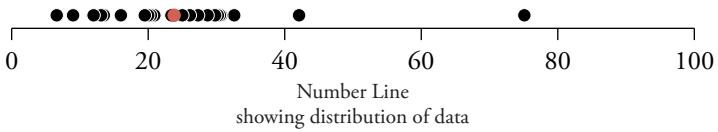
National = 13.2
Texas = 22.8
Louisiana = 5.9

Recent Population Change



Projected Population Change

Population projections can be made with some accuracy for short and mid-range time spans. Projections can help planners anticipate potential impacts on park resources. For example, population growth can generate changes in land use and transportation, growth of new and existing communities, and increases in the demand for park experiences. Within the Big Thicket National Preserve region, the projected increase in county population by the year 2020 ranges from 6.6% (Jefferson) to 75.1% (Montgomery).[2]

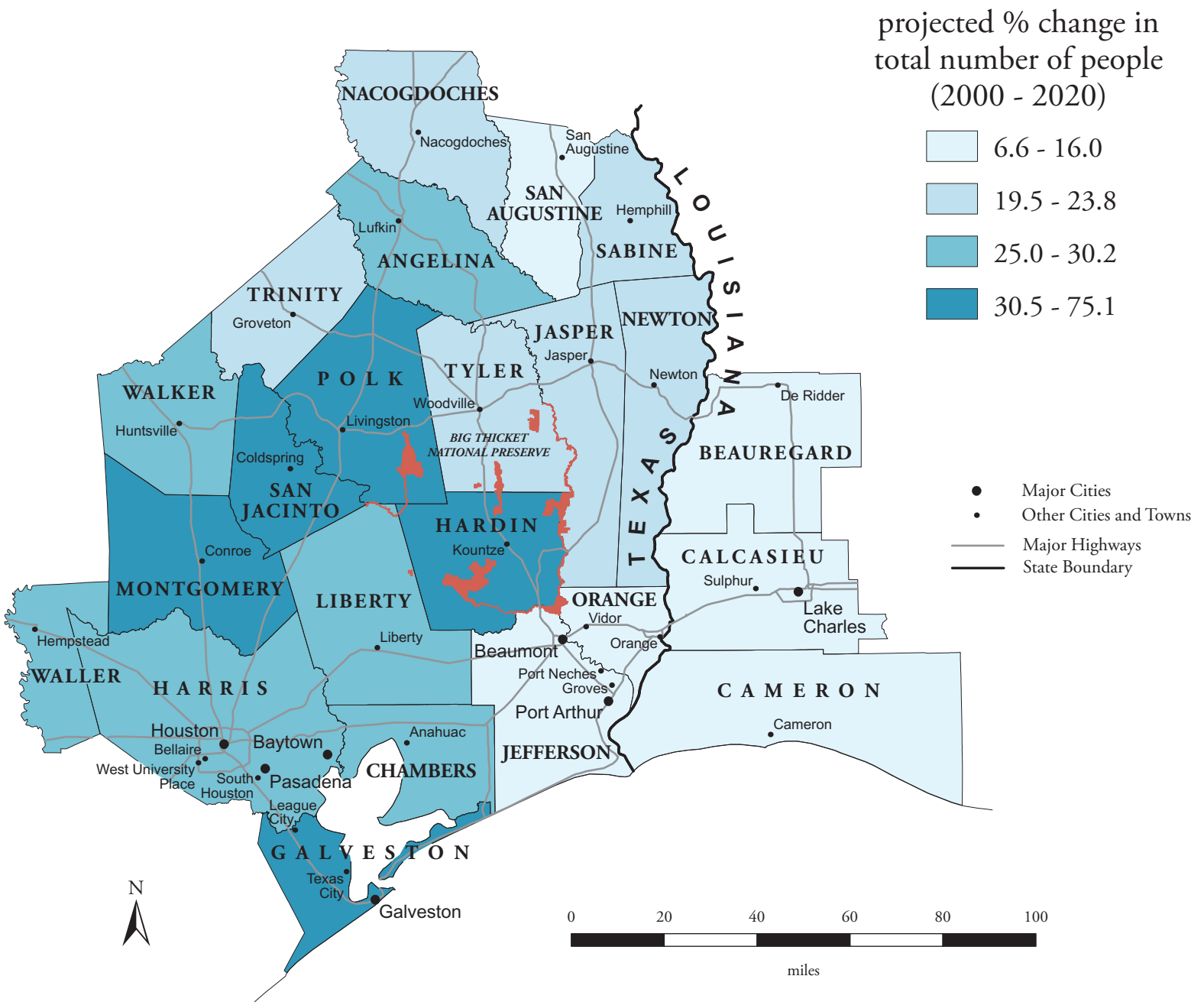


Number Line
showing distribution of data

	projected % change in total number of people (2000 - 2020)		
Jefferson	6.6	Chambers	26.1
San Augustine	9.0	Harris	27.3
Orange	12.0	Liberty	28.7
Beauregard	13.1	Waller	29.8
Cameron	13.5	Walker	30.2
Calcasieu	16.0	Galveston	30.5
Newton	19.5	Polk	30.7
Tyler	20.0	Hardin	32.6
Sabine	20.4	San Jacinto	42.1
Jasper	20.9	Montgomery	75.1
Nacogdoches	23.4		
Trinity	**23.8**		
Angelina	25.0		

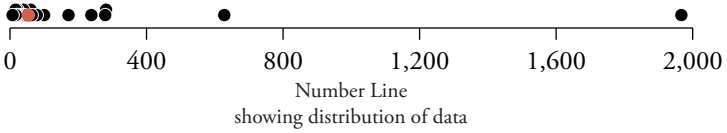
National = 21.1
Texas = 33.3
Louisiana = 13.7

Projected Population Change



Population Density

Population density is a measure of population in terms of persons per square mile. Higher concentrations of people tend to support more business activities and can generate greater demand for public goods ranging from roads to open space. Thus, monitoring differences in population density can be an important way to detect potential stresses and impacts on natural resources in the park region. Within the Big Thicket National Preserve region, county population density (2000) ranges from 7.6 people per square mile (Cameron) to 1,966.9 people per square mile (Harris).[3]

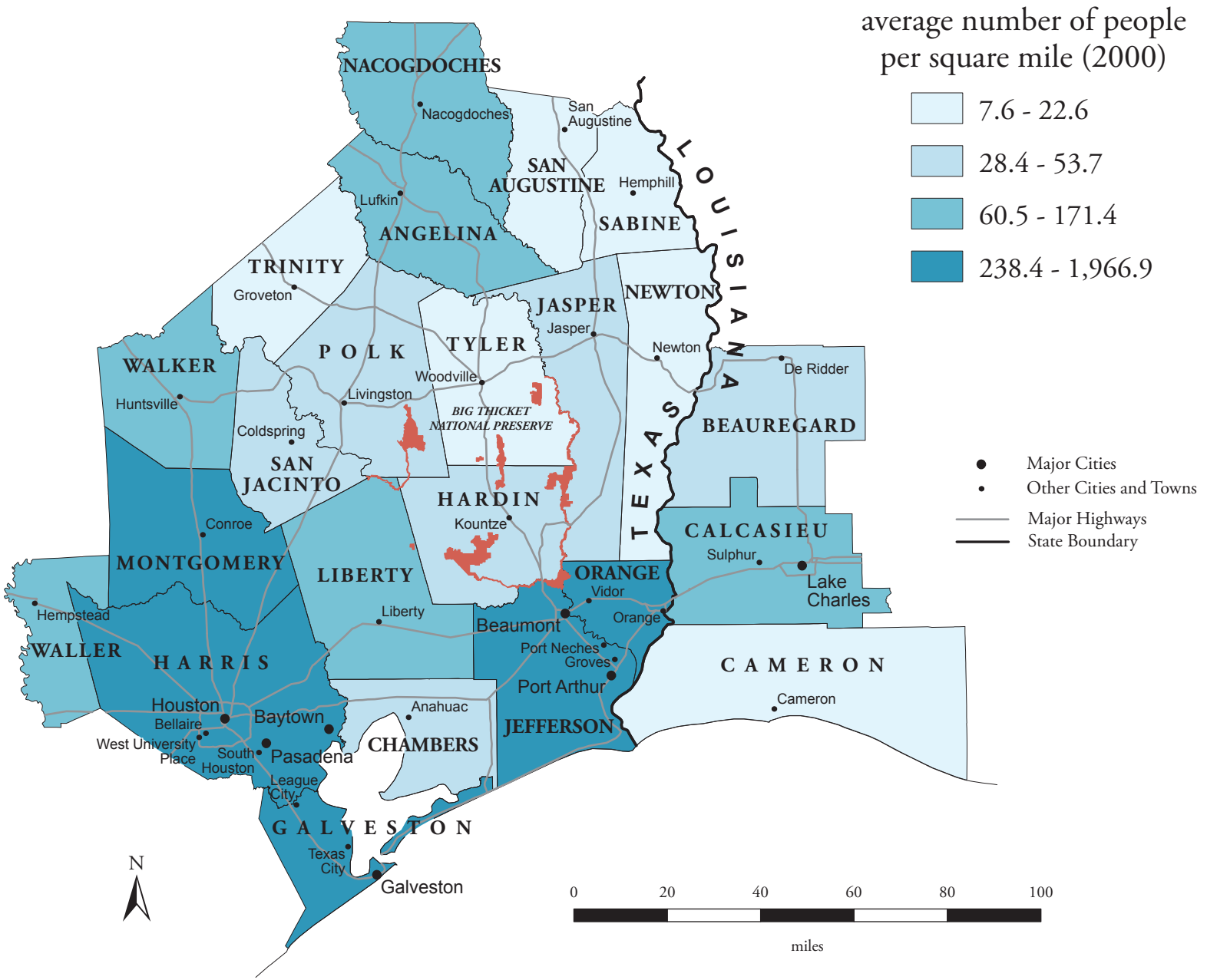


Number Line
showing distribution of data

average number of people per square mile (2000)			
Cameron	7.6	Nacogdoches	62.5
Newton	16.2	Waller	63.6
San Augustine	16.9	Walker	78.4
Trinity	19.9	Angelina	100.0
Sabine	21.4	Calcasieu	171.4
Tyler	22.6	Orange	238.4
Beauregard	28.4	Jefferson	278.9
Jasper	38.0	Montgomery	281.4
Polk	38.9	Galveston	627.8
San Jacinto	39.0	Harris	1,966.9
Chambers	43.4		
Hardin	**53.7**		
Liberty	60.5		

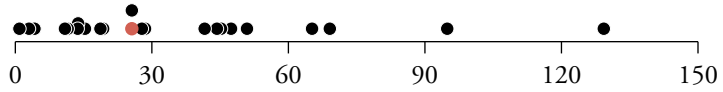
National = 79.6
Texas = 79.6
Louisiana = 102.6

Population Density



Population Density Change

Population density change is an alternate means to describe population growth, stability, or decline. Steady or decelerating growth over a 20-year time period suggests that government and institutions can anticipate and plan for needs in advance. Accelerating population growth may be placing stress on government and institutions to respond rapidly to changes in civic life, industry, infrastructure, and the use of land and resources. Within the Big Thicket National Preserve region, the change in county population density (1980 - 2000) ranges from 0.9% (San Augustine) to 129.3% (Montgomery).[4]



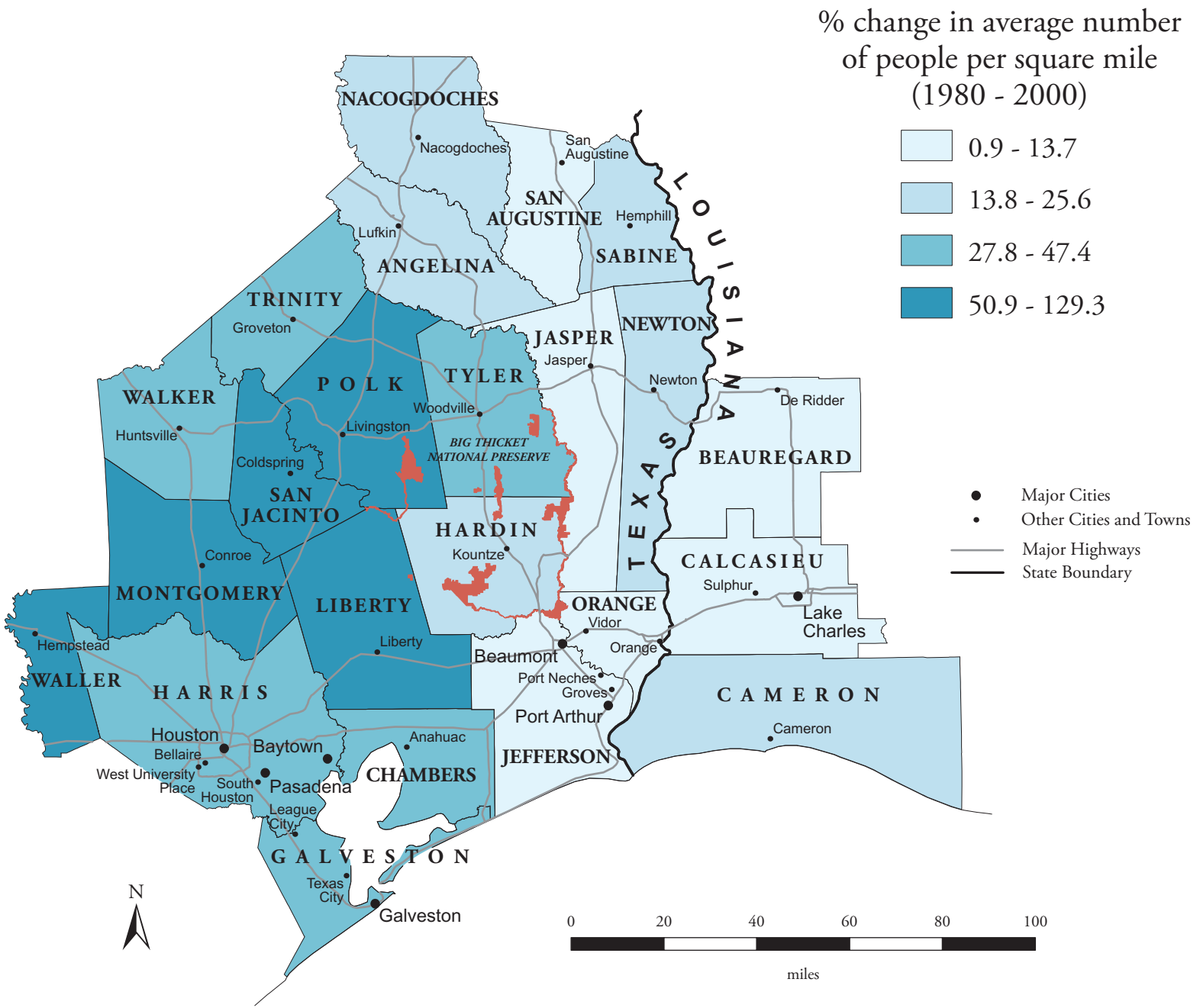
Number Line
showing distribution of data

% change in average number of people per square mile (1980 - 2000)

San Augustine	0.9	Tyler	28.5
Orange	3.0	Harris	41.6
Jefferson	4.2	Chambers	44.3
Calcasieu	10.9	Trinity	45.2
Beauregard	11.5	Walker	47.4
Jasper	13.7	Liberty	50.9
Newton	13.8	Waller	65.2
Cameron	15.3	Polk	69.1
Hardin	18.7	San Jacinto	94.9
Sabine	19.3	Montgomery	129.3
Nacogdoches	**25.6**		
Angelina	**25.6**		
Galveston	27.8		

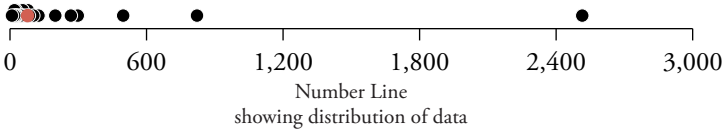
National = 24.3
Texas = 46.7
Louisiana = 8.6

Population Density Change



Projected Population Density

Population density projections are based on population projections. Future regional variations in county population density suggest variations in how counties will approach decisions about natural resource-related issues such as transportation, zoning, and water supply. Significantly increased population density can generate rising land costs as well as increased demand for open space to be used for recreation or conservation. Within the Big Thicket National Preserve region, projected county population density for the year 2020 ranges from 8.6 people per square mile (Cameron) to 2,514.8 people per square mile (Harris).[5]



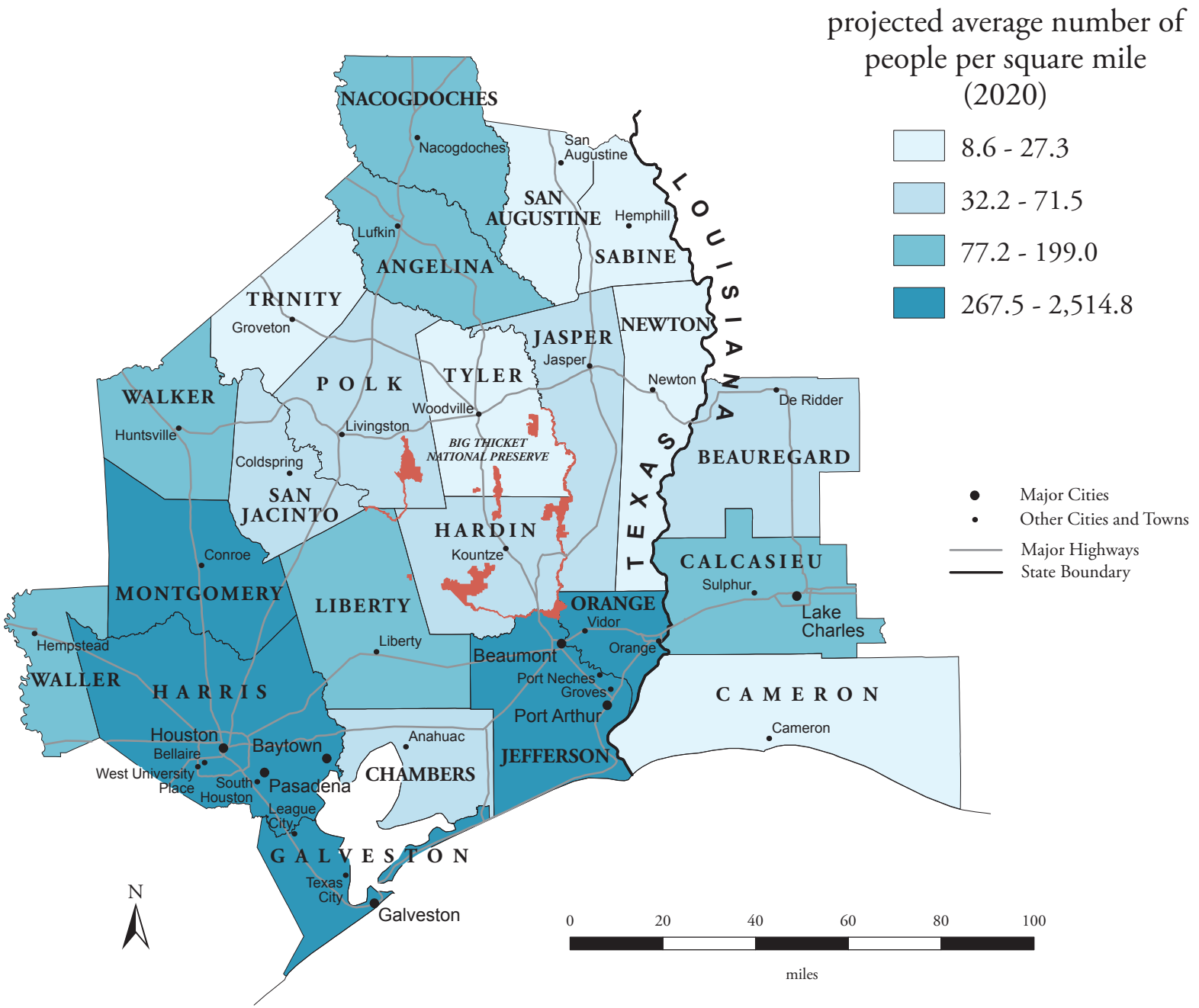
Number Line
showing distribution of data

projected average number of people per square mile (2020)

Cameron	8.6	Liberty	78.3
San Augustine	18.5	Waller	83.1
Newton	19.3	Walker	102.5
Trinity	24.6	Angelina	125.2
Sabine	25.7	Calcasieu	199.0
Tyler	27.3	Orange	267.5
Beauregard	32.2	Jefferson	297.8
Jasper	46.1	Montgomery	497.4
Polk	51.1	Galveston	821.8
Chambers	55.0	Harris	2,514.8
San Jacinto	55.8		
Hardin	**71.5**		
Nacogdoches	77.2		

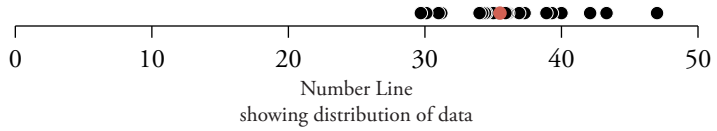
National = 96.6
Texas = 106.7
Louisiana = 116.6

Projected Population Density



Median Age

Median age expresses the age of a "typical" county resident for whom half the population is older and half is younger. Just as age is an important influence on individual behavior, the median age of a county's population can influence its character in many ways. For example, a relatively young county population might place a higher priority on schools, while a relatively old county population might place a higher priority on health care. Within the Big Thicket National Preserve region, the median age of total population (2000) ranges from 29.7 (Nacogdoches) to 47.0 (Sabine).



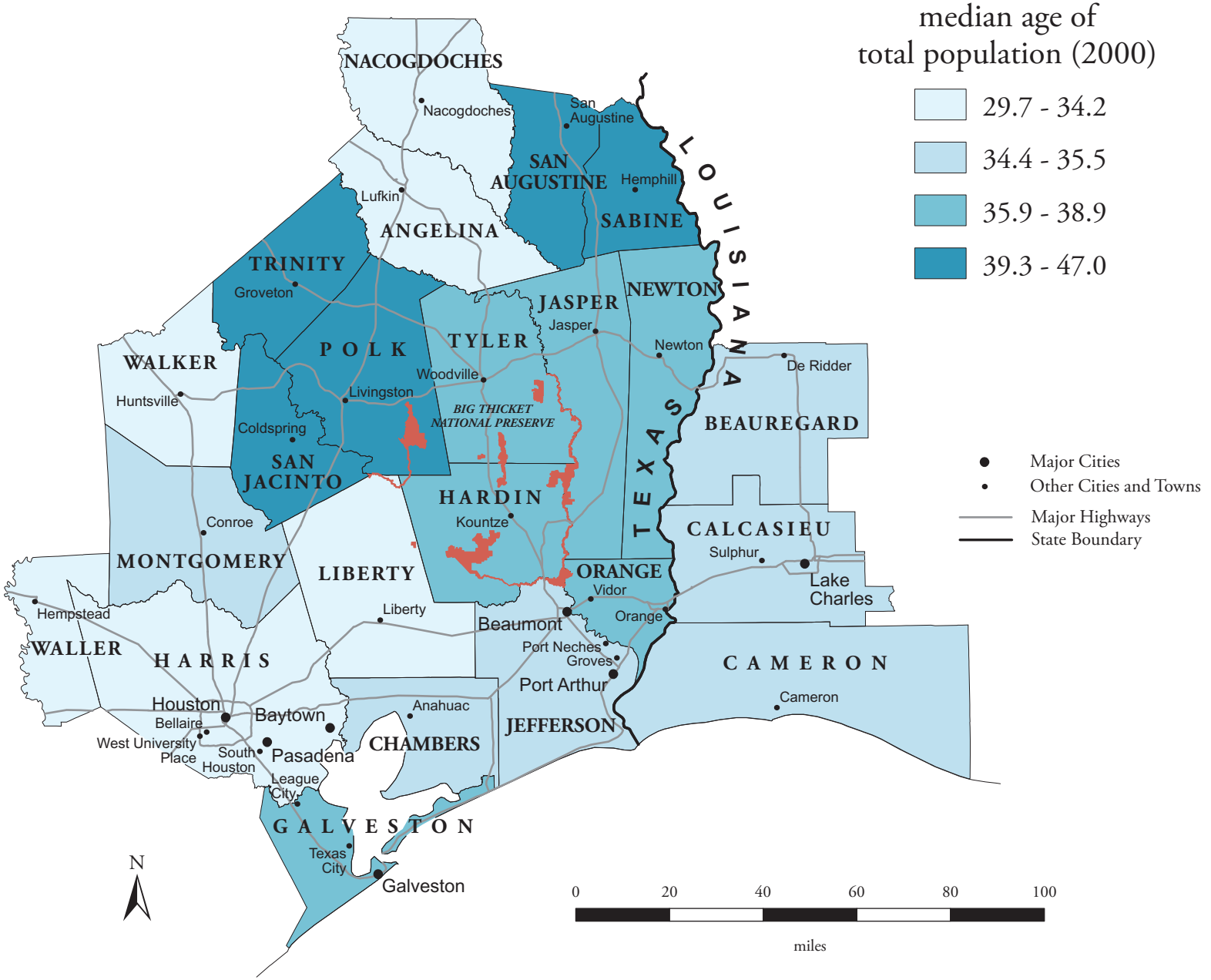
Number Line
showing distribution of data

median age of
total population (2000)

Nacogdoches	29.7	Hardin	36.0
Waller	30.1	Orange	36.1
Walker	31.0	Newton	36.9
Harris	31.2	Jasper	37.3
Liberty	34.0	Tyler	38.9
Angelina	34.2	Polk	39.3
Montgomery	34.4	San Jacinto	40.0
Calcasieu	34.5	San Augustine	42.1
Cameron	35.0	Trinity	43.3
Chambers	35.1	Sabine	47.0
Jefferson	35.3		
Beauregard	**35.5**		
Galveston	35.9		

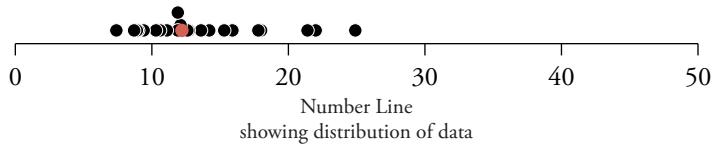
National = 35.3
Texas = 36.7
Louisiana = 34.6

Median Age


median age of
total population (2000)
29.7 - 34.2
34.4 - 35.5
35.9 - 38.9
39.3 - 47.0
NACOGDOCHES
Nacogdoches
San Augustine
SAN AUGUSTINE
Hemphill
SABINE
LOUISIANA
Lufkin
ANGELINA
TRINITY
Groveton
JASPER
Jasper
NEWTON
Newton
De Ridder
POLK
TYLER
Woodville
WALKER
Huntsville
Livingston
BIG THICKET
NATIONAL PRESERVE
BEAUREGARD
Coldspring
SAN JACINTO
HARDIN
Kountze
TEXAS
Conroe
CALCASIEU
Sulphur
MONTGOMERY
LIBERTY
ORANGE
Vidor
Lake Charles
Hempstead
Liberty
Beaumont
Orange
WALLER
HARRIS
Port Neches
Groves
CAMERON
Port Arthur
Houston
Bellaire
Baytown
Anahuac
Cameron
JEFFERSON
West University Place
South Houston
Pasadena
CHAMBERS
League City
GALVESTON
Texas City
Galveston
N
Major Cities
Other Cities and Towns
Major Highways
State Boundary
0
20
40
60
80
100
miles

Elderly Population

The size of a county's elderly population is measured as the percentage of its residents who are 65 years old and over. In counties with a higher percentage of older people, there may be a higher demand for health care and recreational activities more suited to the elderly. There may also be a net inflow of dollars into the local economy in the form of medical, retirement, and disability payments. Aspects of civic life ranging from volunteerism to political participation may also be influenced by the size of the elderly population. The needs and interests of the regional elderly population can influence park management in many ways, including design of facilities, development of interpretive programs, recruitment of volunteers, and visitor use schedules and preferences. Within the Big Thicket National Preserve region, the percentage of county residents 65 years old and over (2000) ranges from 7.4% (Harris) to 24.9% (Sabine).



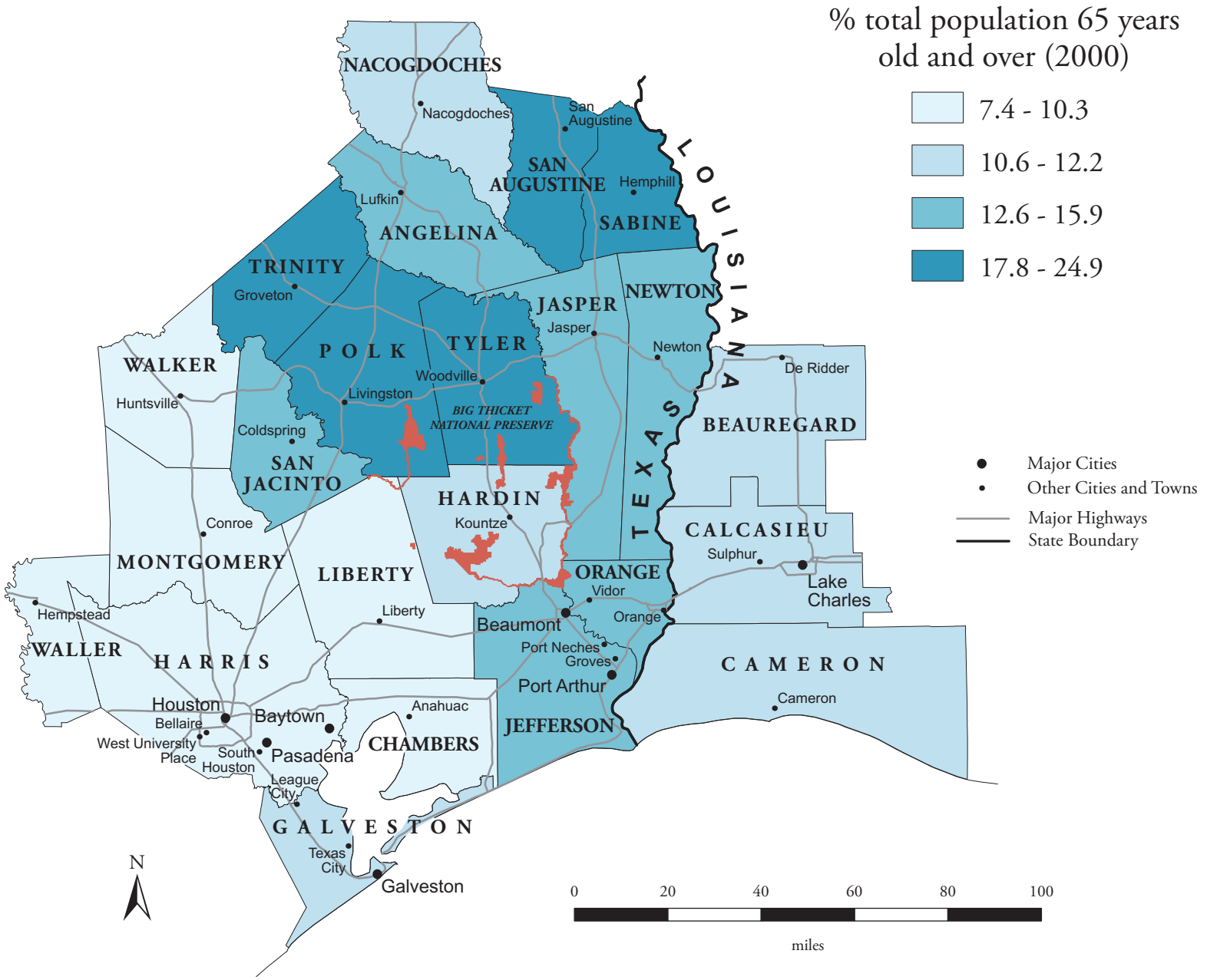
Number Line
showing distribution of data

% total population 65 years old and over (2000)

Harris	7.4	Orange	12.7
Montgomery	8.7	Jefferson	13.6
Walker	8.9	Newton	14.2
Chambers	9.0	Jasper	15.3
Waller	9.4	San Jacinto	15.9
Liberty	10.3	Tyler	17.8
Cameron	10.6	Polk	18.0
Galveston	11.1	San Augustine	21.4
Beauregard	11.9	Trinity	22.0
Calcasieu	11.9	Sabine	24.9
Nacogdoches	12.1		
Hardin	**12.2**		
Angelina	12.6		

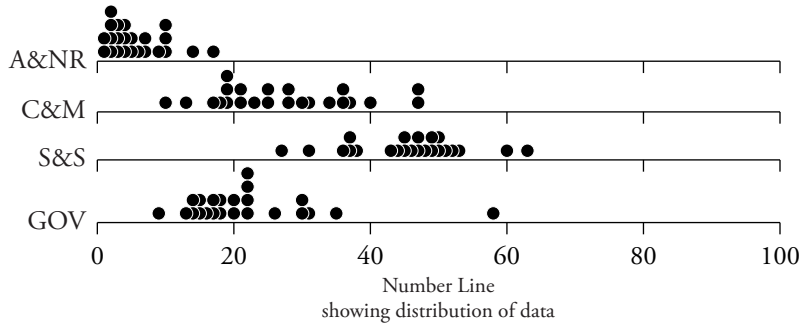
National = 12.4
Texas = 9.9
Louisiana = 11.6

Elderly Population



Earnings by Industry

Earnings by industry are indicative of the overall size of a local economy as well as the relative importance of each major industrial sector within that economy. The diversity of economic activities in the region presents an array of challenges to park management. For example, relatively mobile industries such as light manufacturing or financial services may be concerned with land costs and tax rates, whereas natural resource dependent industries such as farming or mining may be concerned with land use regulations and other environmental policies. Within the Big Thicket National Preserve region (1999), the leading sector of earnings in 19 counties is Sales and Services. The second-ranking sector is Construction and Manufacturing.[6]



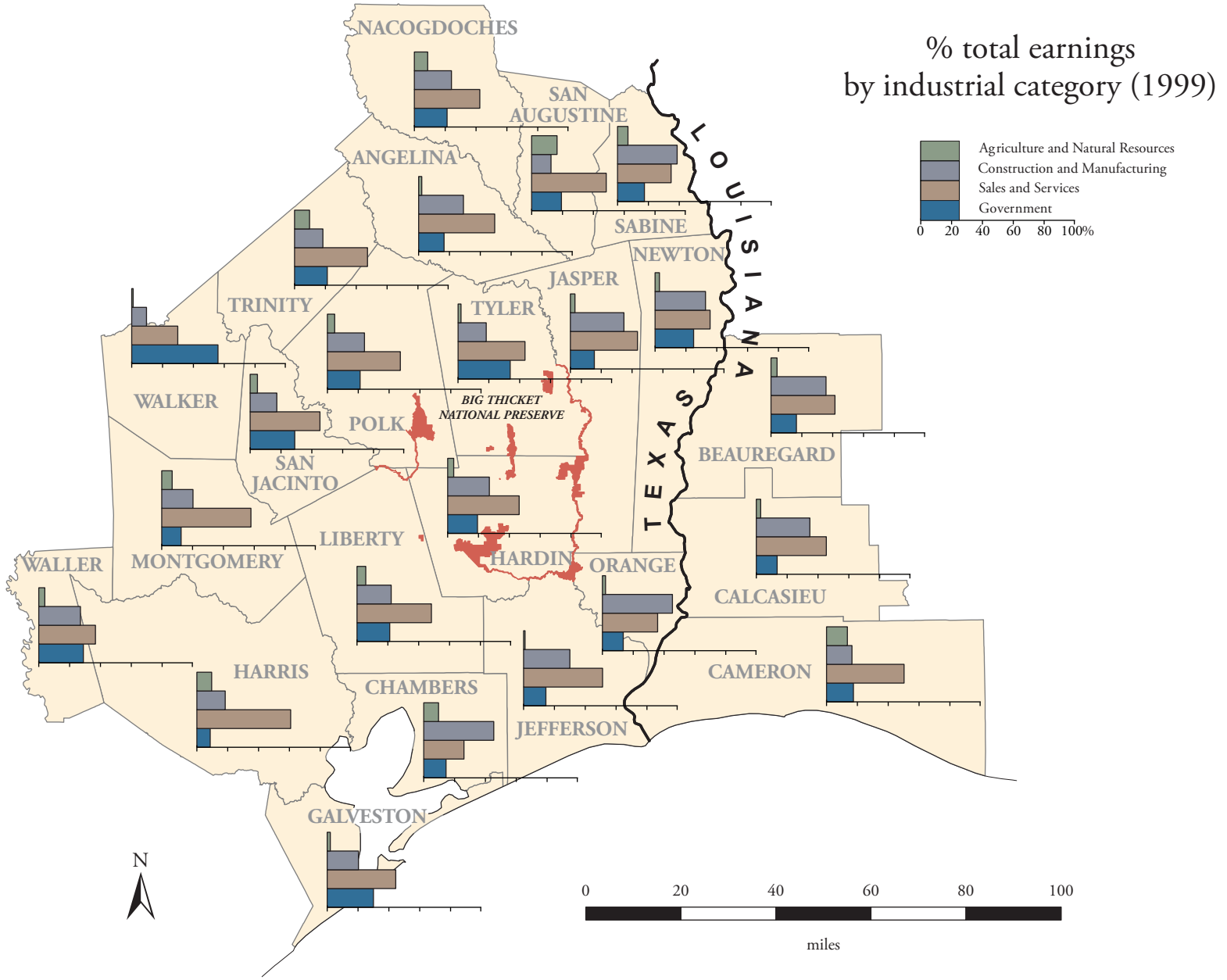
A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government

Percentages may not add to one hundred due to rounding.

% total earnings
by industrial category (1999)

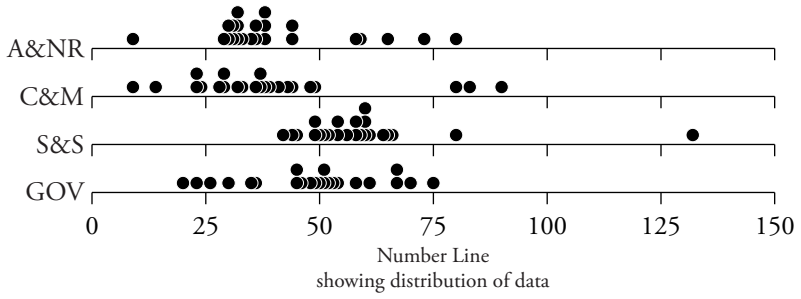
	A&NR	C&M	S&S	GOV
Angelina	2	30	51	17
Beauregard	4	37	43	17
Calcasieu	3	36	47	14
Cameron	14	17	52	18
Chambers	10	47	27	15
Galveston	2	21	46	31
Hardin	4	28	48	20
Harris	10	19	63	9
Jasper	3	36	45	16
Jefferson	1	31	53	15
Liberty	6	23	50	22
Montgomery	7	21	60	13
Nacogdoches	9	25	44	22
Newton	3	34	37	26
Orange	2	47	37	14
Polk	5	25	49	22
Sabine	7	40	36	18
San Augustine	17	13	50	20
San Jacinto	5	18	47	30
Trinity	10	19	49	22
Tyler	2	19	45	35
Walker	1	10	31	58
Waller	4	28	38	30
National	2	22	60	16
Texas	6	20	60	14
Louisiana	6	20	55	19

Earnings by Industry



Projected Change in Earnings by Industry

Projected change in earnings by industry may be indicative of growth, stability, or decline in specific sectors of the local economy in each county. Such projections may serve as an early predictor of localized economic restructuring. Different economic activities within the region present an array of challenges to park management. Monitoring trends in the relative stability of these economic activities can assist park managers in being responsive to change. Within the Big Thicket National Preserve region (2000 - 2020), the Sales and Services sector shows the largest projected increase in 11 counties.[7]

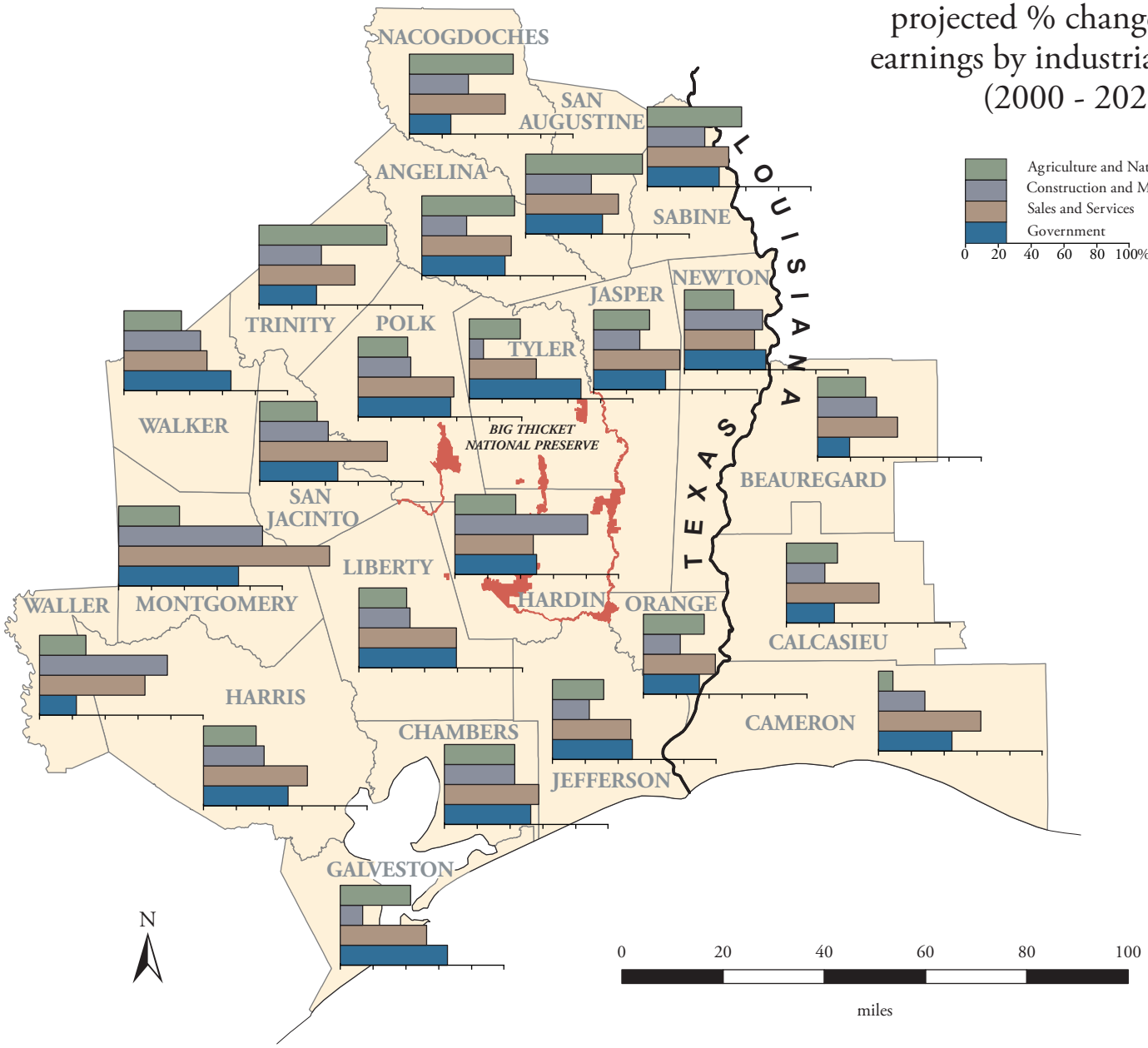


A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government

projected % change in total earnings by industrial category (2000 - 2020)

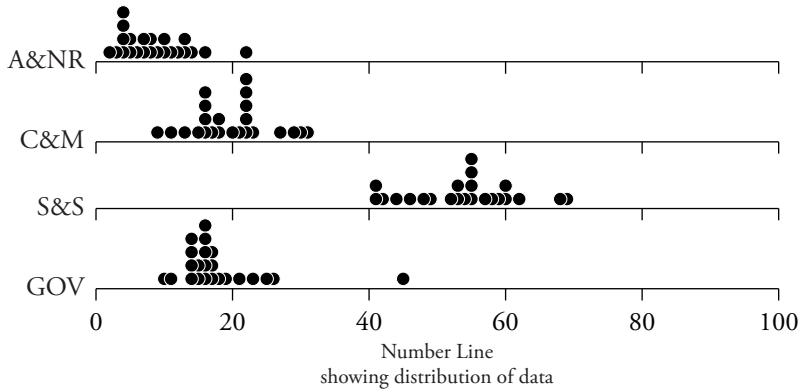
	A&NR	C&M	S&S	GOV
Angelina	58	28	56	52
Beauregard	30	37	50	20
Calcasieu	32	24	58	30
Cameron	9	29	64	46
Chambers	44	44	59	54
Galveston	44	14	54	67
Hardin	38	83	49	51
Harris	33	38	65	53
Jasper	35	29	54	45
Jefferson	32	23	49	50
Liberty	30	32	61	61
Montgomery	38	90	132	75
Nacogdoches	65	37	60	26
Newton	31	49	44	51
Orange	38	23	45	35
Polk	31	33	60	58
Sabine	59	36	51	45
San Augustine	73	41	58	48
San Jacinto	36	43	80	49
Trinity	80	39	60	36
Tyler	32	9	42	70
Walker	36	48	52	67
Waller	29	80	66	23
National	38	29	63	39
Texas	35	41	77	52
Louisiana	35	28	55	38

Projected Change in Earnings by Industry



Employment by Industry

One indicator of the way a particular county's job market is structured is the percentage of workers employed in each of the four major industrial sectors. This employment distribution is indicative of the kinds of skills, knowledge, and concerns that are most prevalent among workers. Occupational patterns can influence people's priorities and actions with regard to parks and resource protection. For example, construction workers might welcome the prospect of rapid growth, whereas government workers such as teachers and police might worry that rapid growth would stress existing government resources. Within the Big Thicket National Preserve region (1999), the leading sector of employment in 22 counties is Sales and Services. The second-ranking sector is Government.[8]



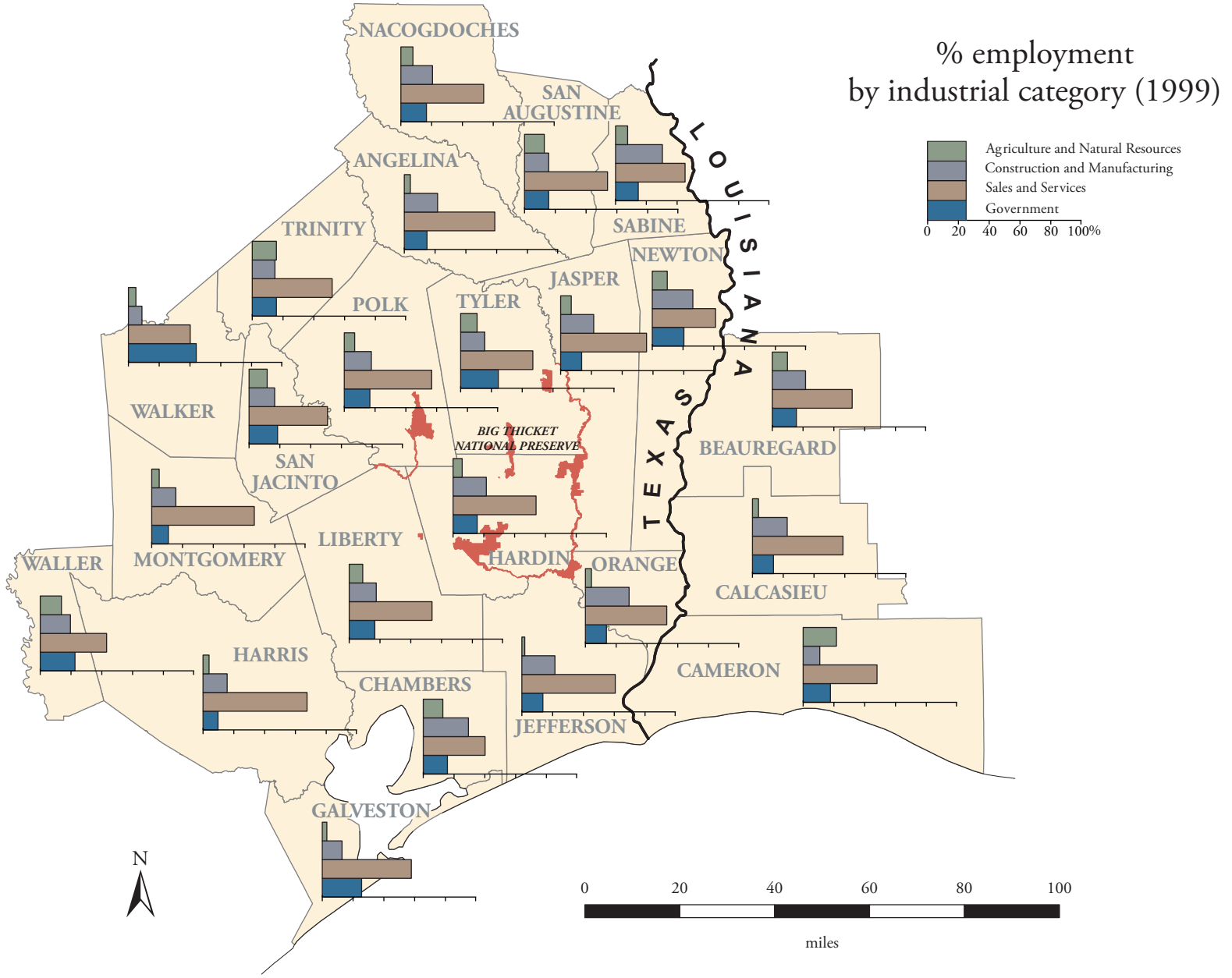
A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government

% employment
by industrial category (1999)

	A&NR	C&M	S&S	GOV
Angelina	4	22	60	15
Beauregard	10	22	53	16
Calcasieu	4	23	60	14
Cameron	22	11	49	18
Chambers	13	30	41	16
Galveston	3	13	59	26
Hardin	6	22	55	16
Harris	4	16	69	10
Jasper	7	22	57	14
Jefferson	2	22	62	14
Liberty	9	18	55	17
Montgomery	5	16	68	11
Nacogdoches	8	21	55	17
Newton	10	27	42	21
Orange	4	29	54	14
Polk	7	18	58	17
Sabine	8	31	46	15
San Augustine	13	16	55	16
San Jacinto	12	17	52	19
Trinity	16	15	53	16
Tyler	11	16	48	25
Walker	5	9	41	45
Waller	14	20	44	23
National	4	17	65	14
Texas	5	16	64	14
Louisiana	5	15	62	17

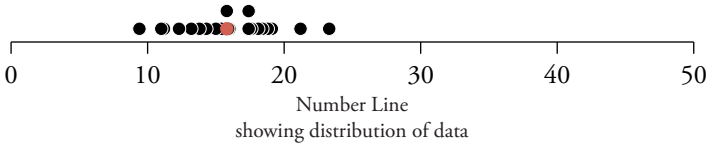
Percentages may not add to one hundred due to rounding.

Employment by Industry



Poverty

Poverty is officially defined as the condition of living in a household with income below the federally-determined poverty threshold ($17,029 in 1999 for a family of four people). The extent of poverty can be measured as the percentage of the total population living below that threshold. Those living in poverty can face such difficulties as finding adequate housing and health care, getting enough food, and reaching job sites and government services, including parks. The level of poverty in the park region necessarily becomes significant to park management decisions and priorities. Within the Big Thicket National Preserve region, the incidence of poverty (1999) ranges from 9.4% (Montgomery) to 23.3% (Nacogdoches).[9]

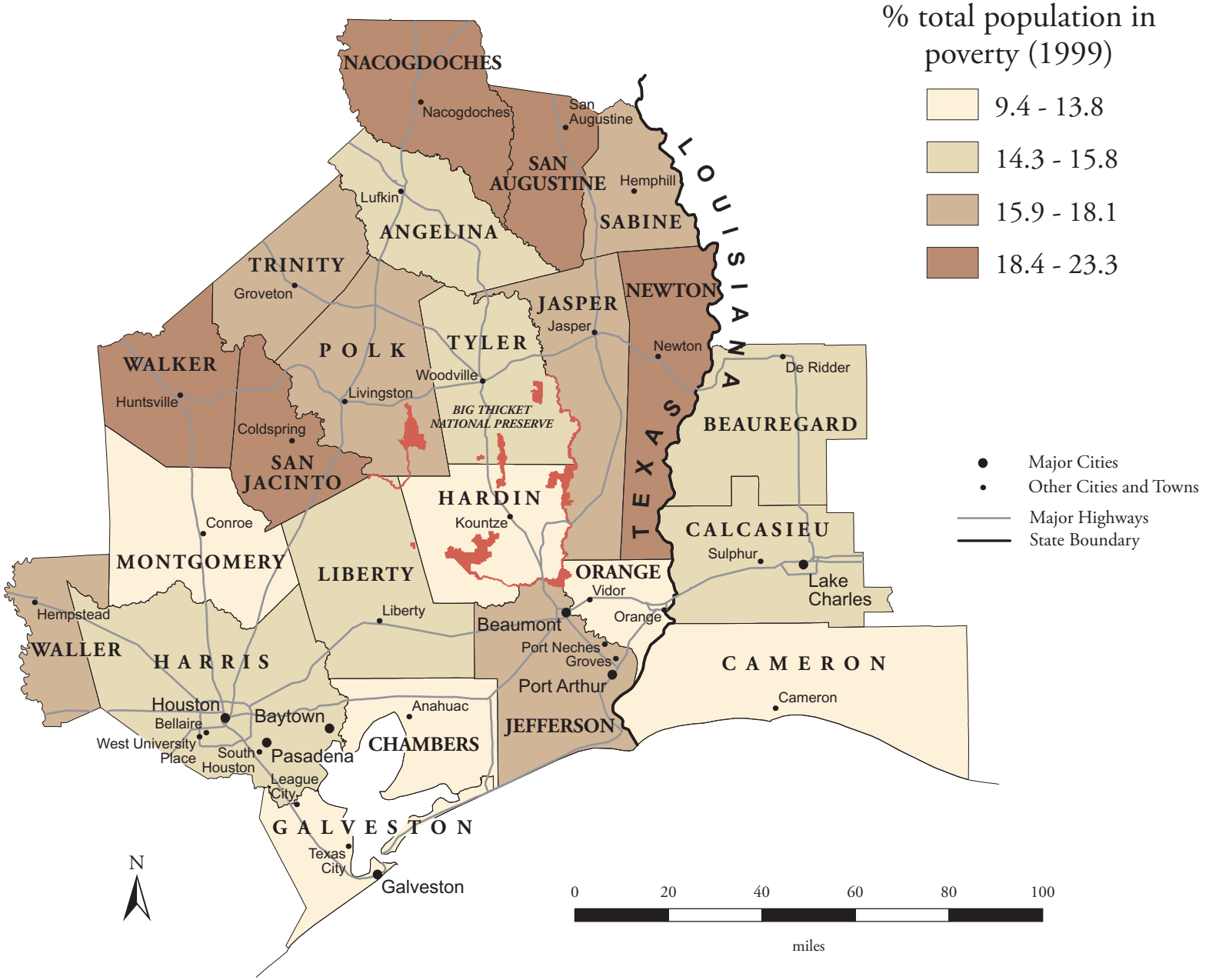


Number Line
showing distribution of data

% total population in poverty (1999)			
Montgomery	9.4	Waller	16.0
Chambers	11.0	Jefferson	17.4
Hardin	11.2	Polk	17.4
Cameron	12.3	Trinity	17.6
Galveston	13.2	Jasper	18.1
Orange	13.8	Walker	18.4
Liberty	14.3	San Jacinto	18.8
Harris	15.0	Newton	19.1
Calcasieu	15.4	San Augustine	21.2
Beauregard	15.6	Nacogdoches	23.3
Angelina	**15.8**		
Tyler	**15.8**		
Sabine	15.9		

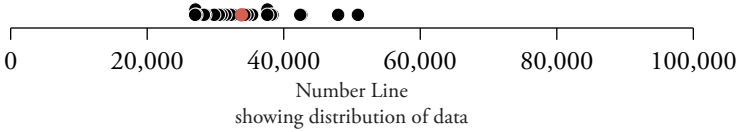
National = 12.4
Texas = 15.4
Louisiana = 19.6

Poverty


% total population in poverty (1999)
9.4 - 13.8
14.3 - 15.8
15.9 - 18.1
18.4 - 23.3
NACOGDOCHES
Nacogdoches
San Augustine
SAN AUGUSTINE
Hemphill
SABINE
Lufkin
ANGELINA
TRINITY
Groveton
JASPER
Jasper
NEWTON
Newton
POLK
TYLER
Woodville
WALKER
Huntsville
Livingston
BIG THICKET NATIONAL PRESERVE
Coldspring
SAN JACINTO
HARDIN
Kountze
LOUISIANA
TEXAS
De Ridder
BEAUREGARD
Conroe
MONTGOMERY
LIBERTY
CALCASIEU
Sulphur
Lake Charles
ORANGE
Vidor
Orange
Hempstead
Liberty
Beaumont
Port Neches
Groves
WALLER
HARRIS
CAMERON
Port Arthur
Houston
Anahuac
Cameron
Bellaire
Baytown
JEFFERSON
West University Place
South Houston
Pasadena
CHAMBERS
League City
GALVESTON
Texas City
Galveston
N
0 20 40 60 80 100
miles
Major Cities
Other Cities and Towns
Major Highways
State Boundary

Median Household Income

Median household income is indicative of the general level of income among households in a county. The median value is the central value in a ranked dataset, with an equal number of observations both above and below the median. General income measures can provide insights into the opportunities and time available for recreation in the park region. Within the Big Thicket National Preserve region, median household income (1999) ranges from $27,025 (San Augustine) to $50,864 (Montgomery).

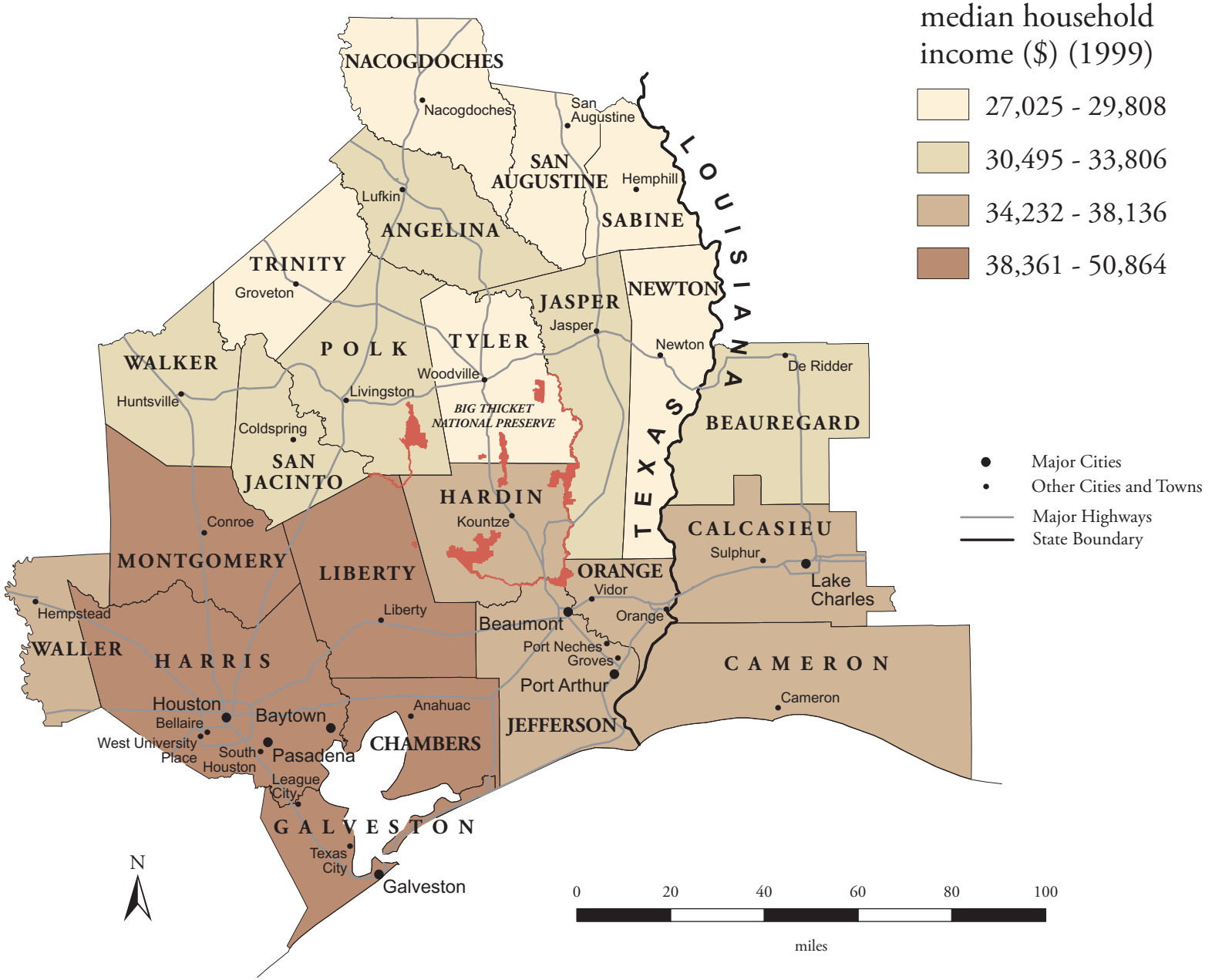


Number Line
showing distribution of data

	median household income ($) (1999)		
San Augustine	27,025	Jefferson	34,706
Trinity	27,070	Calcasieu	35,372
Sabine	27,198	Orange	37,586
Nacogdoches	28,301	Hardin	37,612
Newton	28,500	Waller	38,136
Tyler	29,808	Liberty	38,361
Polk	30,495	Galveston	42,419
Jasper	30,902	Harris	42,598
Walker	31,468	Chambers	47,964
San Jacinto	32,220	Montgomery	50,864
Beauregard	32,582		
Angelina	**33,806**		
Cameron	34,232		

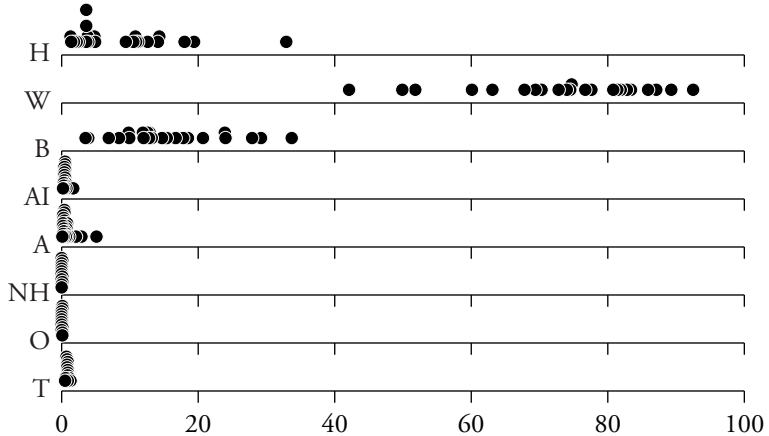
National = 41,994
Texas = 32,694
Louisiana = 30,091

Median Household Income



Racial and Ethnic Composition

Racial and ethnic composition is indicated by the relative size of each of the major race groups and the separate Hispanic ethnic category as classified by the U.S. Census Bureau. These characteristics of the region's population reveal its diversity, which informs park activities such as interpretation and outreach. Within the Big Thicket National Preserve region (2000), White people constitute the largest racial group in all 23 counties. Jefferson County has the largest percentage of Black people and Harris County has the largest percentage of Hispanic people.[10]



Number Line
showing distribution of data

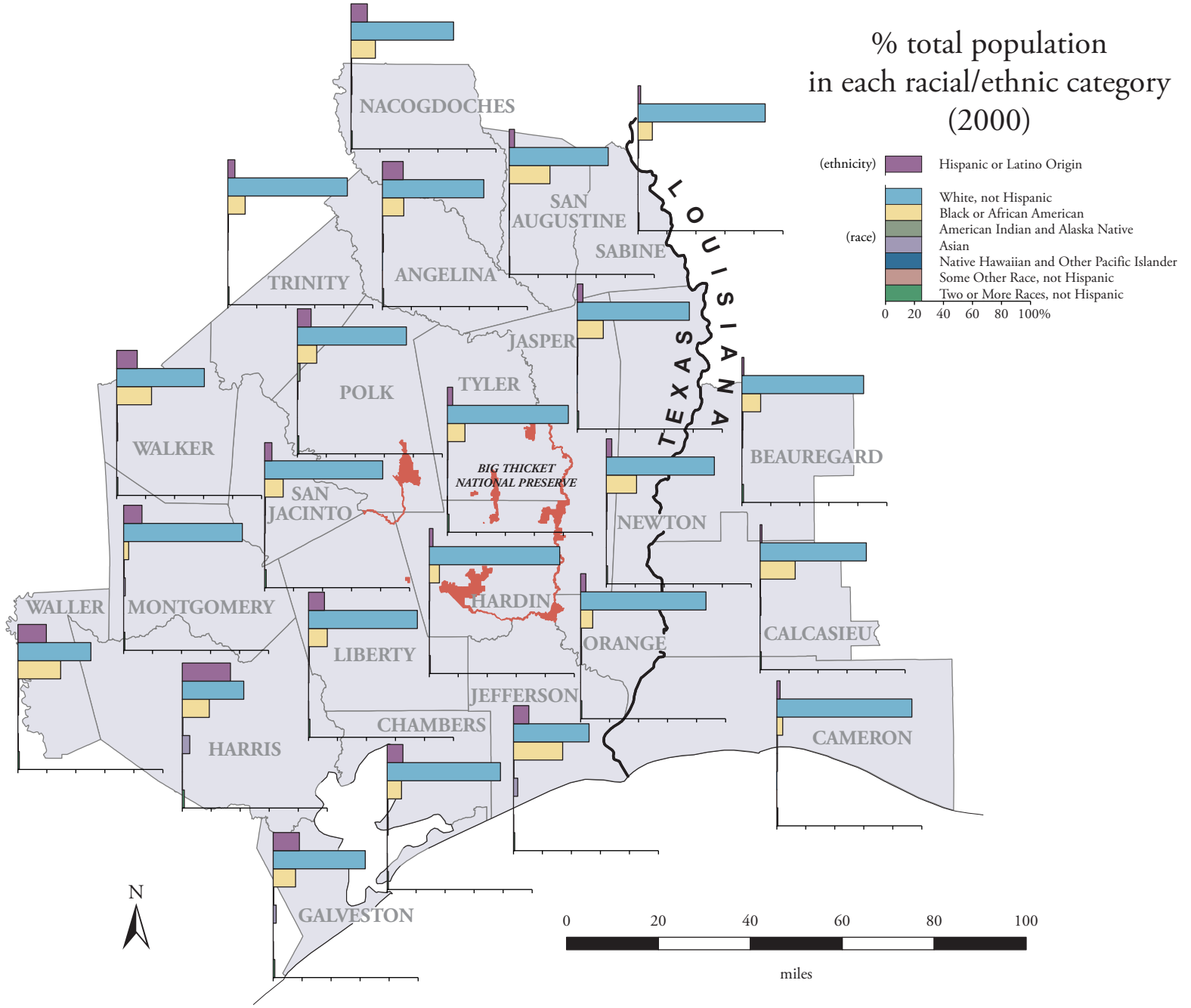
H = Hispanic or Latino Origin
W = White, not Hispanic
B = Black or African American
AI = American Indian and Alaska Native
A = Asian
NH = Native Hawaiian and Other Pacific Islander
O = Some Other Race, not Hispanic
T = Two or More Races, not Hispanic

Percentages for race may not add to one hundred due to rounding

% total population in each racial/ethnic category (2000)

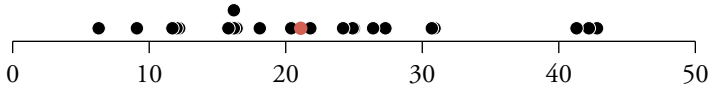
	H	W	B	AI	A	NH	O	T
Angelina	14	69	15	0	1	0	0	1
Beauregard	1	83	13	1	1	0	0	1
Calcasieu	1	73	24	0	1	0	0	1
Cameron	2	93	4	0	0	0	0	1
Chambers	11	78	10	1	1	0	0	1
Galveston	18	63	15	1	2	0	0	1
Hardin	3	89	7	0	0	0	0	1
Harris	33	42	19	0	5	0	0	1
Jasper	4	77	18	0	0	0	0	1
Jefferson	11	52	34	0	3	0	0	1
Liberty	11	75	13	1	0	0	0	1
Montgomery	13	81	4	1	1	0	0	1
Nacogdoches	11	70	17	0	1	0	0	1
Newton	4	74	21	1	0	0	0	1
Orange	4	86	8	1	1	0	0	1
Polk	9	75	13	2	0	0	0	1
Sabine	2	87	10	0	0	0	0	1
San Augustine	4	68	28	0	0	0	0	1
San Jacinto	5	81	13	1	0	0	0	1
Trinity	5	82	12	0	0	0	0	1
Tyler	4	83	12	0	0	0	0	1
Walker	14	60	24	0	1	0	0	1
Waller	19	50	29	1	0	0	0	1
National	13	69	12	1	4	0	0	2
Texas	32	52	12	1	3	0	0	1
Louisiana	2	63	32	1	1	0	0	1

Racial and Ethnic Composition



Racial Diversity

Racial diversity is measured as the percentage of the population belonging to minority groups. In the current U.S. context, "minority" races are defined as non-White (Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races). Interactions among people are often influenced by racial identity. Hence, it makes sense for institutions ranging from retailers to police to parks to consider regional racial diversity when recruiting and training staff, when designing public information and educational materials, and when soliciting public involvement in decision-making. Within the Big Thicket National Preserve region, the percentage of racial minorities (2000) ranges from 6.3% (Cameron) to 42.8% (Jefferson).[11]



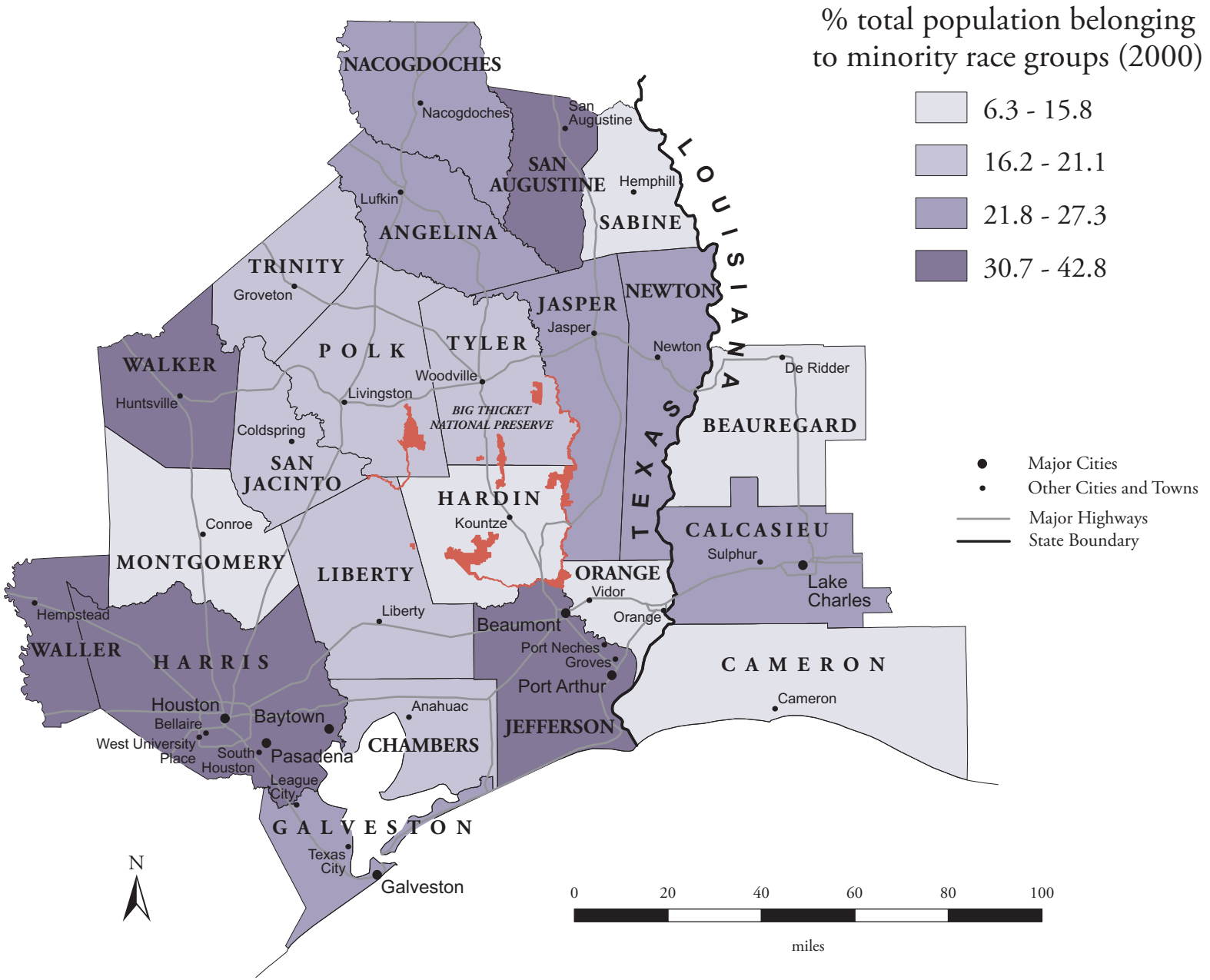
Number Line
showing distribution of data

% total population belonging to minority race groups (2000)

Cameron	6.3	Newton	24.2
Hardin	9.1	Angelina	24.9
Montgomery	11.7	Nacogdoches	25.0
Orange	12.0	Calcasieu	26.4
Sabine	12.2	Galveston	27.3
Beauregard	15.8	San Augustine	30.7
Trinity	16.2	Walker	30.9
Tyler	16.2	Harris	41.3
San Jacinto	16.4	Waller	42.2
Chambers	18.1	Jefferson	42.8
Polk	20.4		
Liberty	**21.1**		
Jasper	21.8		

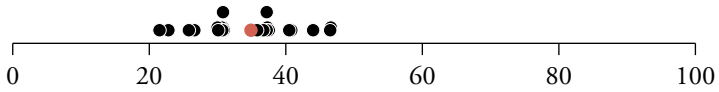
National = 24.9
Texas = 29.0
Louisiana = 36.1

Racial Diversity



Educational Attainment

Educational attainment indicators measure the average amount of formal education that a county's residents have received. One indicator of educational attainment is the percentage of adults who have attended or graduated from college. Educational attainment influences many aspects of life, such as how much money people earn, what they do for recreation, where they get their information, and how they participate in civic life. With regard to park management, the educational attainment of the general public is an important consideration in activities, such as marketing, public participation processes, and the design of interpretive programs. Within the Big Thicket National Preserve region, the percentage of adults with some college education (2000) ranges from 21.5% (Newton) to 46.6% (Montgomery).[12]



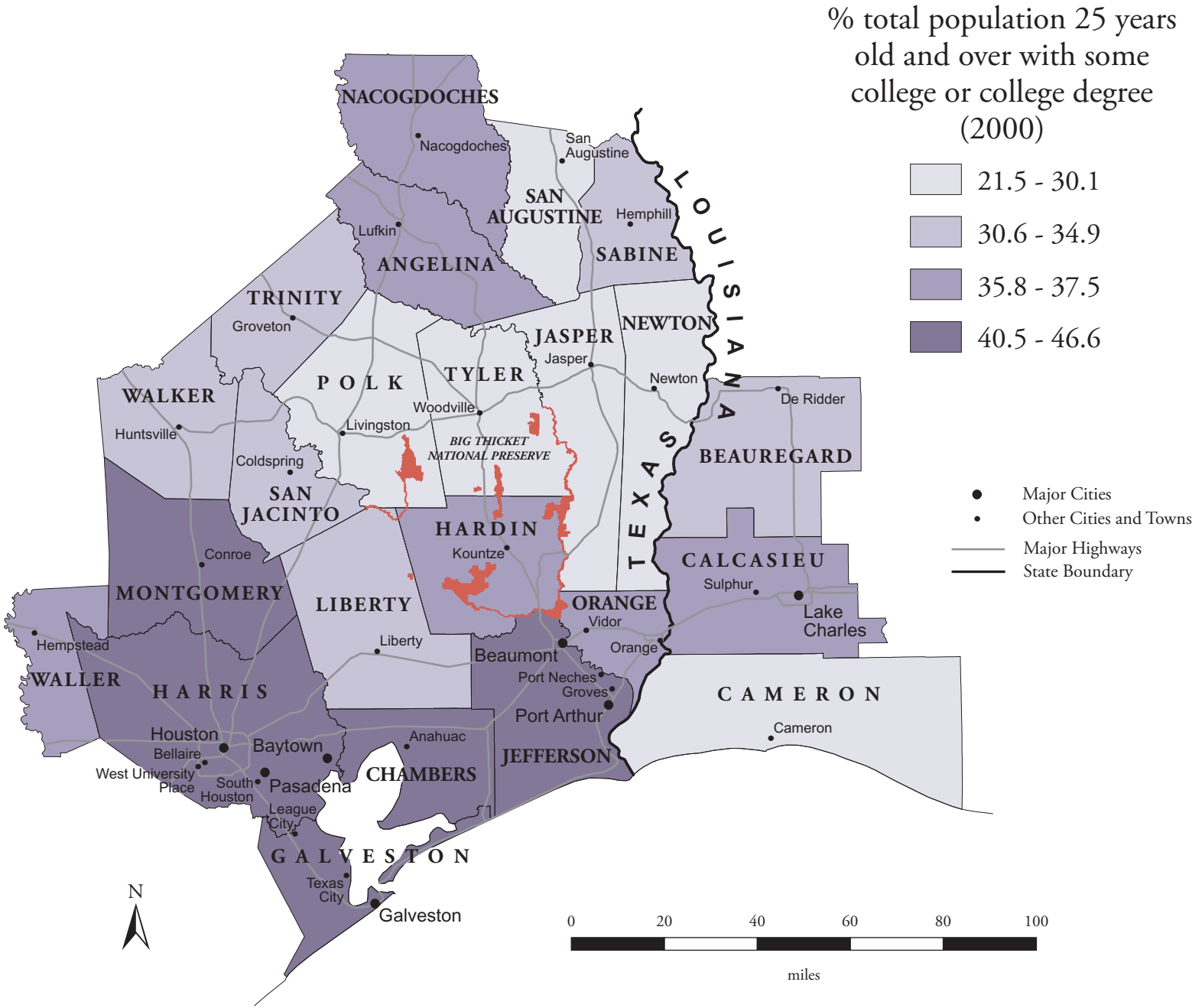
Number Line
showing distribution of data

% total population 25 years old and over with some college or college degeree (2000)

Newton	21.5	Waller	36.7
Cameron	22.8	Calcasieu	37.2
San Augustine	25.8	Nacogdoches	37.2
Tyler	26.6	Angelina	37.3
Jasper	30.0	Orange	37.5
Polk	30.1	Jefferson	40.5
Trinity	30.6	Chambers	40.8
Liberty	30.7	Harris	44.0
Sabine	30.8	Galveston	46.5
San Jacinto	30.8	Montgomery	46.6
Beauregard	30.9		
Walker	**34.9**		
Hardin	35.8		

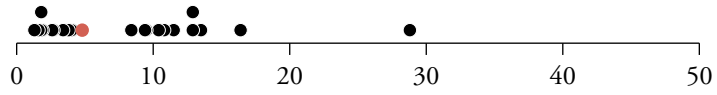
National = 42.9
Texas = 43.2
Louisiana = 35.9

Educational Attainment



Spanish Speakers

Indicators of language ability measure proficiency in languages other than English. For example, one indicator of Spanish language ability is the percentage of people 5 years old and over that speaks primarily Spanish at home. Awareness of people's primary language (other than English) can help park managers customize information and interpretive programs in a certain language, such as Spanish. Within the Big Thicket National Preserve region, the percentage of the total population 5 years old and over that speaks primarily Spanish at home (2000) ranges from 1.3% (Beauregard) to 28.8% (Harris).



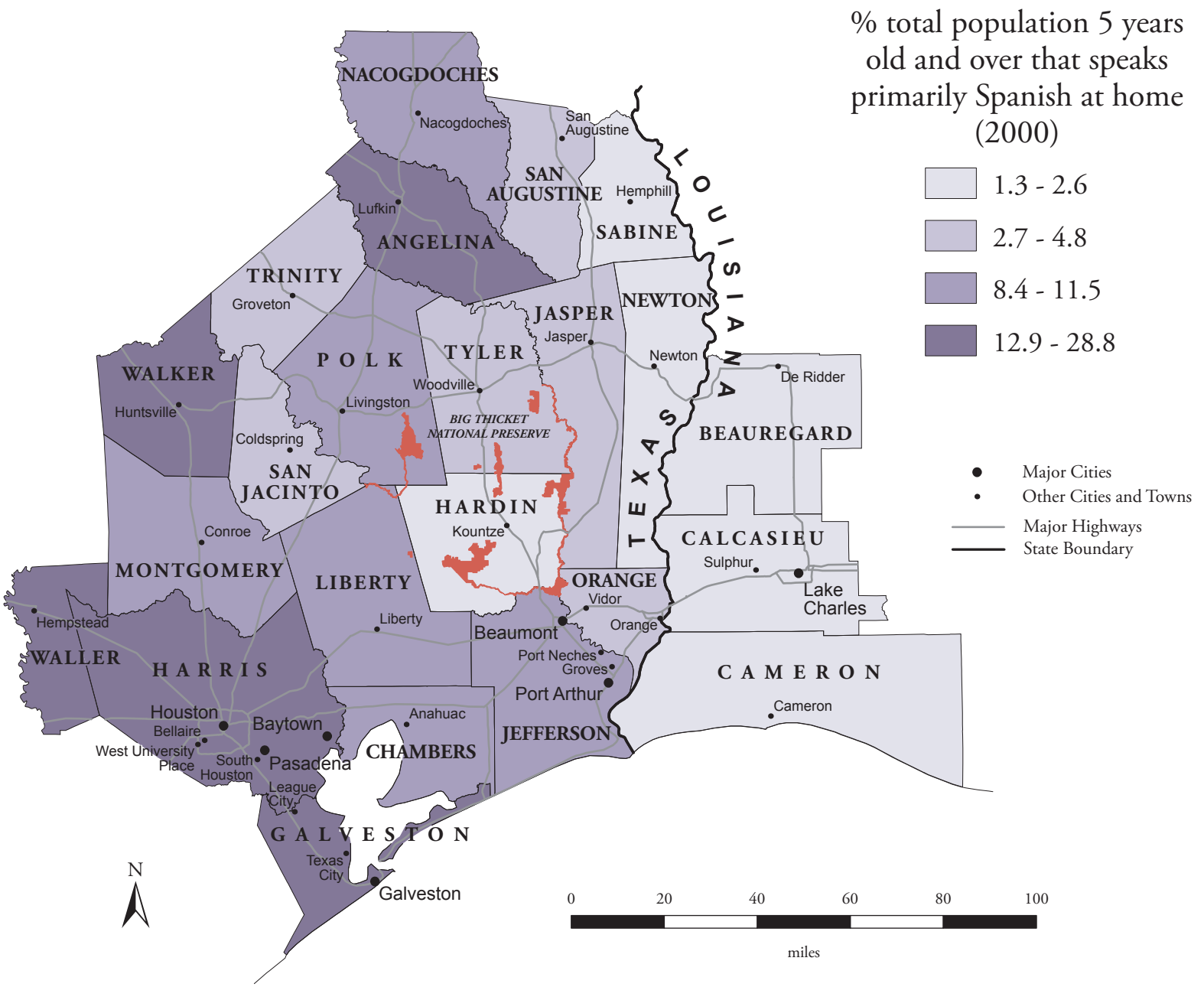
Number Line
showing distribution of data

% total population 5 years old and over that speaks primarily Spanish at home (2000)

Beauregard	1.3	Chambers	9.4
Calcasieu	1.6	Polk	9.5
Hardin	1.8	Nacogdoches	10.4
Sabine	1.8	Liberty	10.8
Cameron	1.9	Montgomery	11.5
Newton	2.6	Angelina	12.9
Orange	2.7	Walker	12.9
San Augustine	3.4	Galveston	13.5
Tyler	3.8	Waller	16.4
Trinity	4.0	Harris	28.8
Jasper	4.1		
San Jacinto	**4.8**		
Jefferson	8.4		

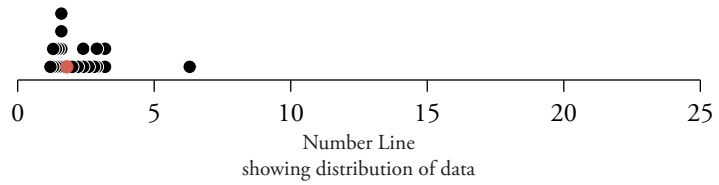
National = 10.7
Texas = 27.0
Louisiana = 2.5

Spanish Speakers



Recreation/Tourism Establishments

The recreation and tourism industry is measured using two categories: the arts, entertainment and recreation sector (ranging from museums and concerts, to sporting events and amusement parks) and the accommodation subsector of the accomodation and food services sector (ranging from hotels to campsites). The size of these sectors is a broad indicator of a county's economic reliance on recreation and tourism relative to the other sectors of the economy. Recreation and tourism establishments can be proponents of actions that enhance their area's attractiveness as a visitor destination (such as transportation improvements, protection of scenic or cultural landmarks, or marketing campaigns). Recreation and tourism establishments also can be vulnerable to, and thus wary of, actions, policies, or chance events that could affect business, such as visitor use restrictions, fires, or economic downturns. Within the Big Thicket National Preserve region, the percentage of total establishments in arts, entertainment, recreation, and accommodation (2001) ranges from 1.2% (Liberty) to 6.3% (Sabine).[13]



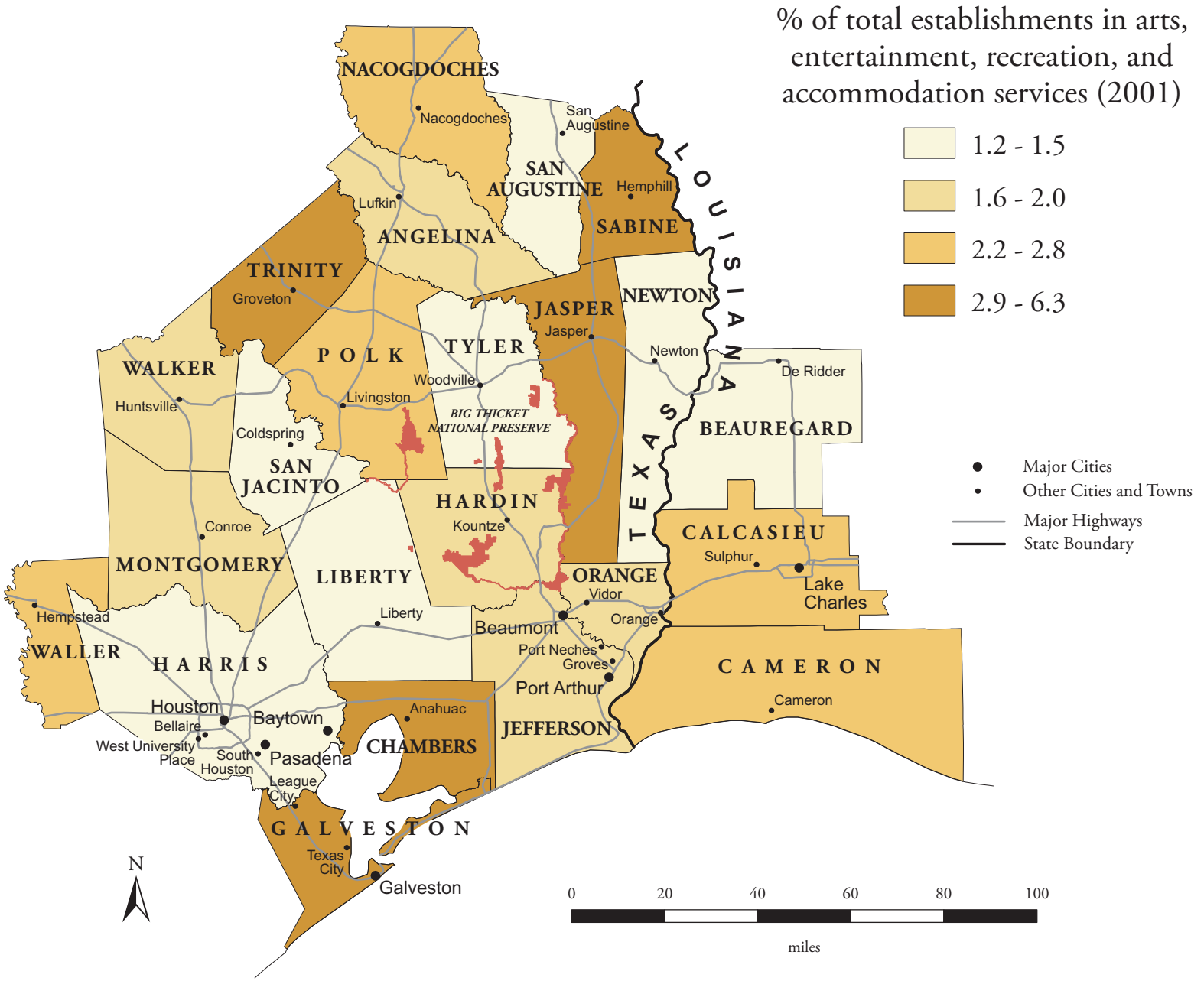
Number Line
showing distribution of data

% of total establishments in arts, entertainment, recreation, and accommodation services (2001)

Liberty	1.2	Nacogdoches	2.2
San Jacinto	1.3	Polk	2.4
Newton	1.3	Calcasieu	2.4
Tyler	1.4	Waller	2.6
San Augustine	1.4	Cameron	2.8
Harris	1.5	Jasper	2.9
Beauregard	1.5	Trinity	2.9
Hardin	1.6	Chambers	3.2
Jefferson	1.6	Galveston	3.2
Montgomery	1.6	Sabine	6.3
Orange	1.6		
Angelina	**1.8**		
Walker	2.0		

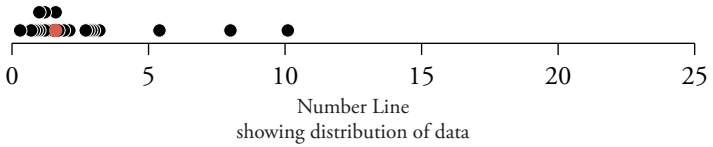
National = 2.3
Texas = 1.9
Louisiana = 2.1

Recreation/Tourism Establishments



Recreation/Tourism Employment

The significance of the recreation/tourism industry to a county economy can be indicated by the percentage of county workers that it employs. Workers counted as recreation and tourism employees include country club managers, blackjack dealers, campground employees, fishing guides, motel attendants, and other providers of recreation services. A high level of recreation/tourism employment may mean that residents have more disposable income or that the area attracts visitors or vacationers. Within the Big Thicket National Preserve region, the percentage of total paid employees in arts, entertainment, recreation, and accommodation services (2001) ranges from 0.3% (Liberty) to 10.1% (Trinity).[14]



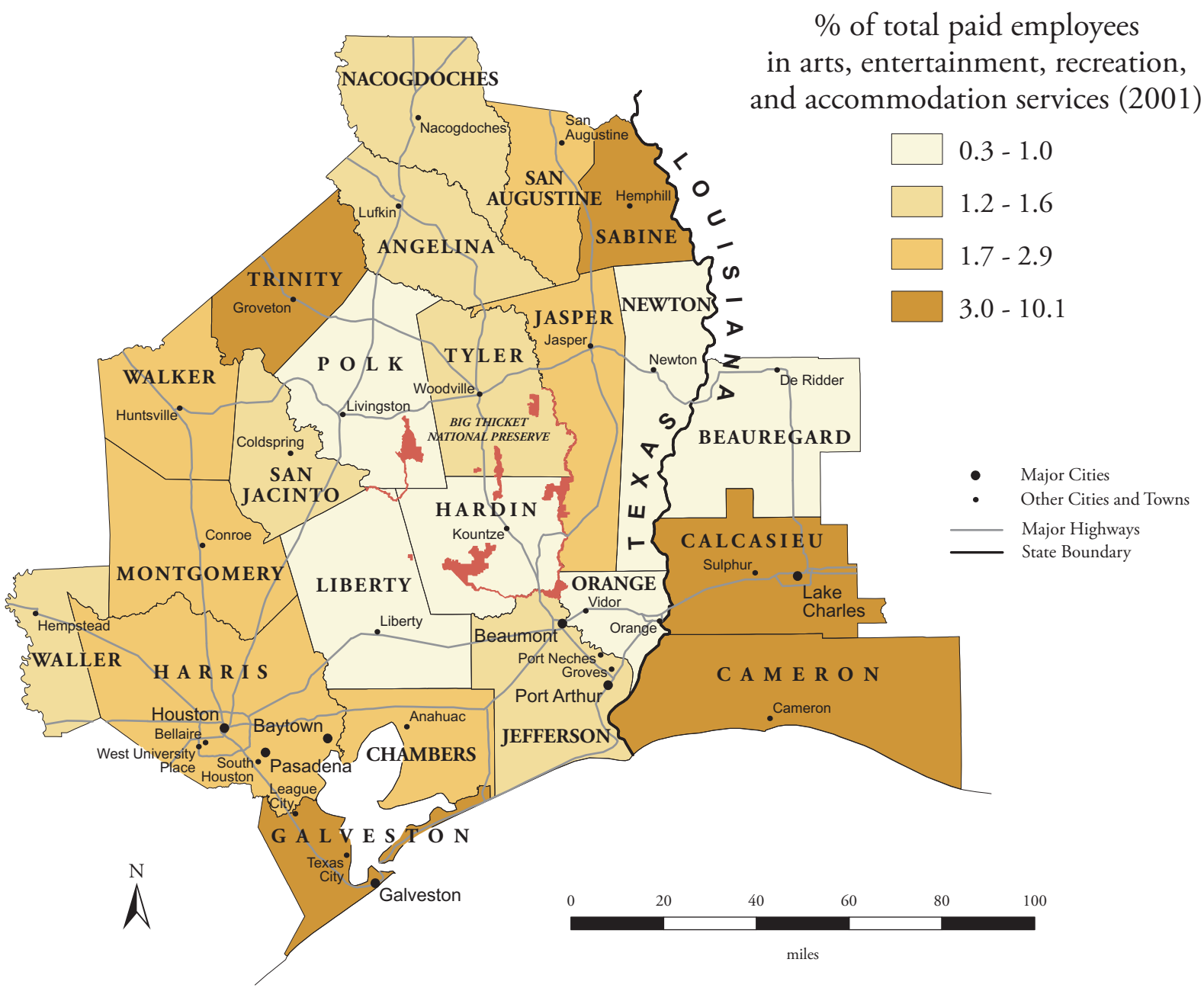
Number Line
showing distribution of data

% of total paid employees in arts, entertainment, recreation, and accommodation services (2001)

Liberty	0.3	Harris	1.9
Newton	0.7	Jasper	2.1
Orange	0.8	Walker	2.7
Hardin	0.9	Montgomery	2.8
Polk	1.0	Chambers	2.9
Beauregard	1.0	Sabine	3.0
San Jacinto	1.2	Cameron	3.2
Jefferson	1.2	Galveston	5.4
Angelina	1.3	Calcasieu	8.0
Waller	1.5	Trinity	10.1
Tyler	**1.6**		
Nacogdoches	**1.6**		
San Augustine	1.7		

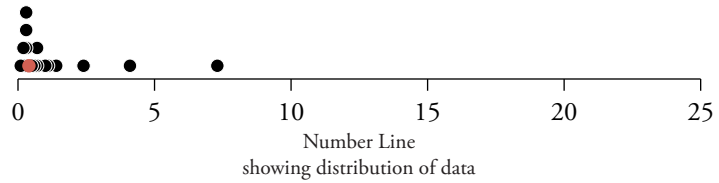
National = 3.1
Texas = 2.2
Louisiana = 4.2

Recreation/Tourism Employment



Recreation/Tourism Revenue

Recreation and tourism revenue is a key indicator of the economic importance of recreation and tourism to a county. Recreation and tourism revenue can be expressed as a percentage of total sales and service receipts. Recreation and tourism establishments can occupy an important position within a county economy because they attract visitor dollars from elsewhere. Secondary economic benefits are realized when these dollars are re-spent within the local economy or deposited in banks, where they provide capital to other businesses. Within the Big Thicket National Preserve region, the percentage of total sales from arts, entertainment, recreation, and accommodation services (1997) ranges from 0.1% (Orange) to 7.3% (Trinity).[15]

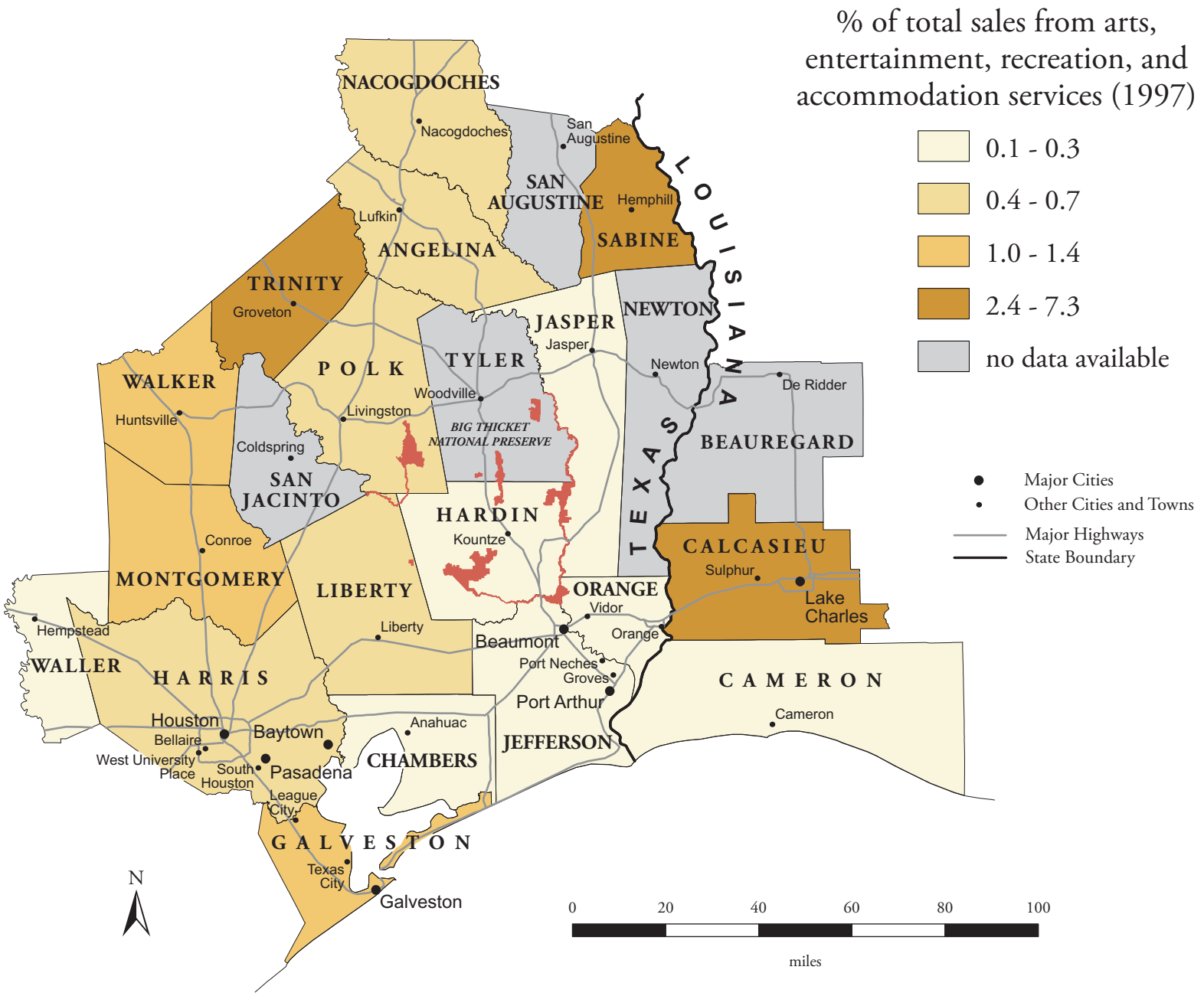


% of total sales from arts, entertainment, recreation, and accommodation services (1997)

Orange	0.1	Montgomery	1.1
Hardin	0.2	Galveston	1.4
Jefferson	0.2	Calcasieu	2.4
Waller	0.3	Sabine	4.1
Cameron	0.3	Trinity	7.3
Chambers	0.3	Beauregard	N/A
Jasper	0.3	Newton	N/A
Liberty	0.4	San Augustine	N/A
Polk	**0.5**	San Jacinto	N/A
Angelina	0.6	Tyler	N/A
Nacogdoches	0.7		
Harris	0.7		
Walker	1.0		

National = 1.1
Texas = 0.7
Louisiana = 1.4

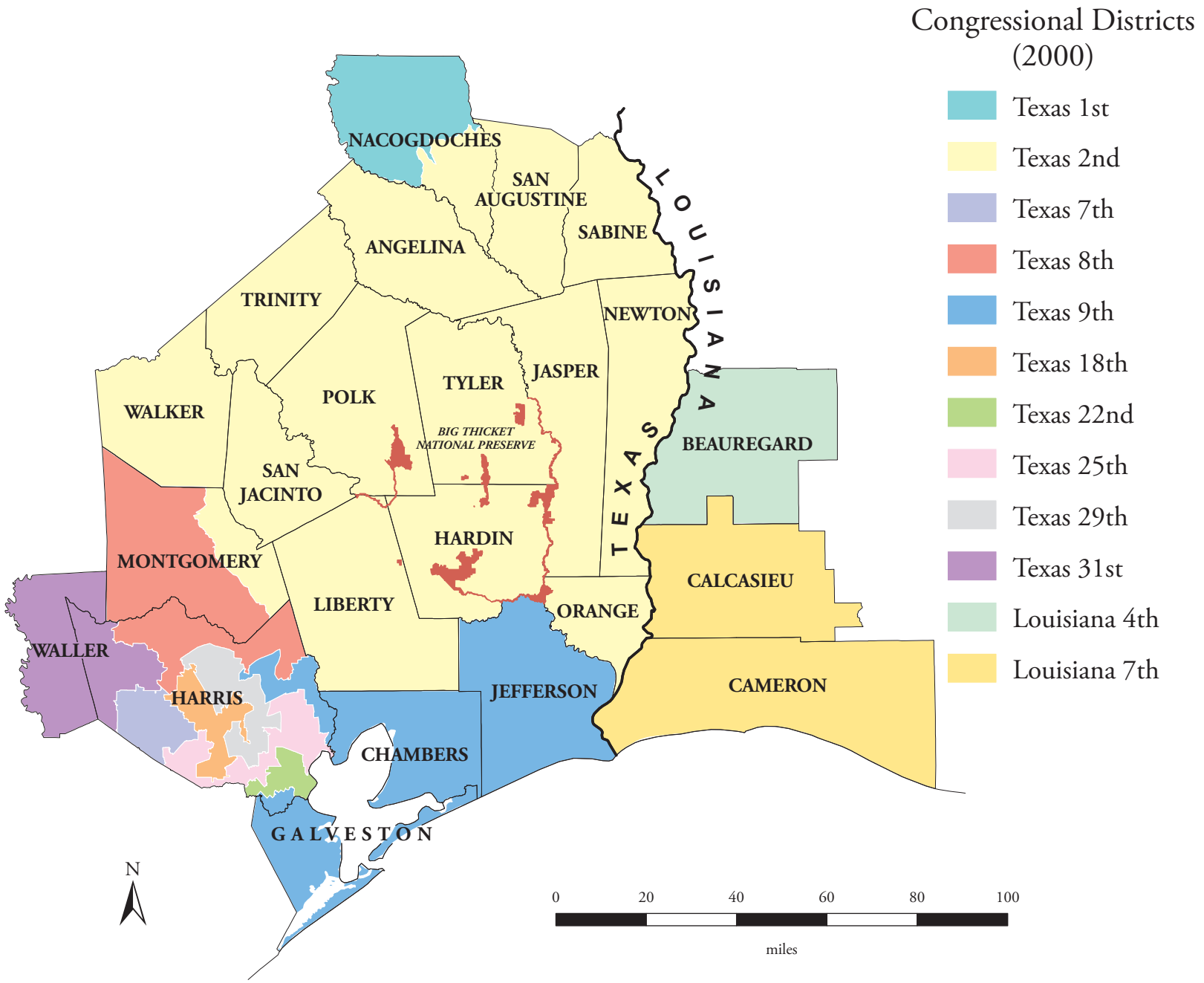
Recreation/Tourism Revenue



Congressional Districts

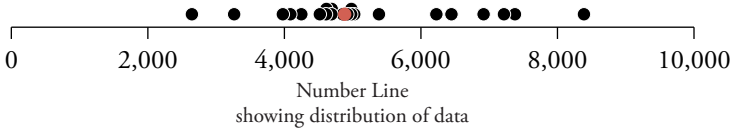
Congressional districts form a key layer in the political structure of a region of interest for a park. These districts, roughly equivalent in population, are defined by state legislatures based on the national census and redrawn every ten years. Members of Congress are key points of access for citizens seeking to influence federal-level policies and programs, including those related to federal lands such as national parks and national forests. The Big Thicket National Preserve region includes all or portions of 12 Congressional districts, 10 of which are in Texas. The districts for the 108th Congress are based on Census 2000.

Congressional Districts



Federal Expenditures

The importance of the federal government to a county economy can be indicated by the amount of federal expenditures per person. These expenditures can be a key source of dollars flowing into the county economy (in contrast, taxes and fees are an outflow of dollars). Federal spending can influence the park region through such wide-ranging initiatives as agricultural subsidies, social programs, military bases, and national parks. Within the Big Thicket National Preserve region, federal expenditures per person (2002) range from $2,645 (Montgomery) to $8,388 (Sabine).[16]



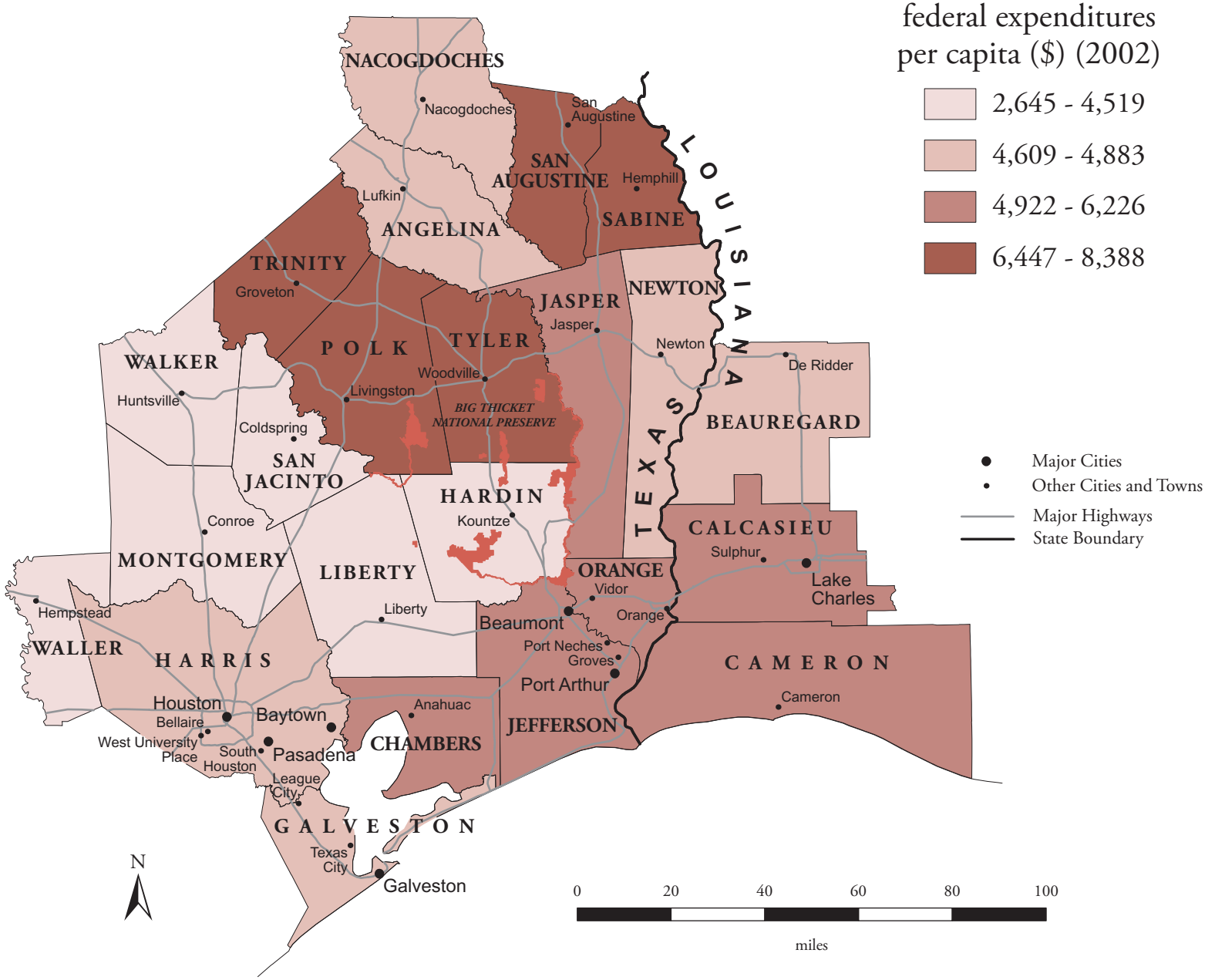
Number Line
showing distribution of data

federal expenditures per capita ($) (2002)

Montgomery	2,645	Chambers	4,979
Walker	3,264	Orange	4,981
San Jacinto	3,977	Cameron	5,023
Hardin	4,087	Jasper	5,385
Waller	4,248	Jefferson	6,226
Liberty	4,519	Trinity	6,447
Galveston	4,609	San Augustine	6,918
Harris	4,615	Polk	7,216
Angelina	4,689	Tyler	7,377
Newton	4,693	Sabine	8,388
Beauregard	4,855		
Nacogdoches	**4,883**		
Calcasieu	4,922		

National = 6,650
Texas = 5,667
Louisiana = 6,690

Federal Expenditures



Ecoregions

Ecoregions are areas in which similar climate, landforms, and soil exist and support similar communities of vegetation and animals. People affect natural systems within an ecoregion through such activities as agriculture, development, creation of protected areas, hunting, and the introduction of non-native species. Natural resource protection efforts throughout an ecoregion may share many of the same approaches and techniques, since these efforts often focus on maintaining or restoring similar communities of indigenous animals and plants. Hence, many challenges of resource protection can be addressed effectively at the ecoregion level.

The Big Thicket NPRES region includes parts of two ecoregion divisions. The majority of the region is classified as Subtropical. In the far western portion of the region, one entire county and parts of five counties are classified as Prairie.

Bailey's Ecoregions

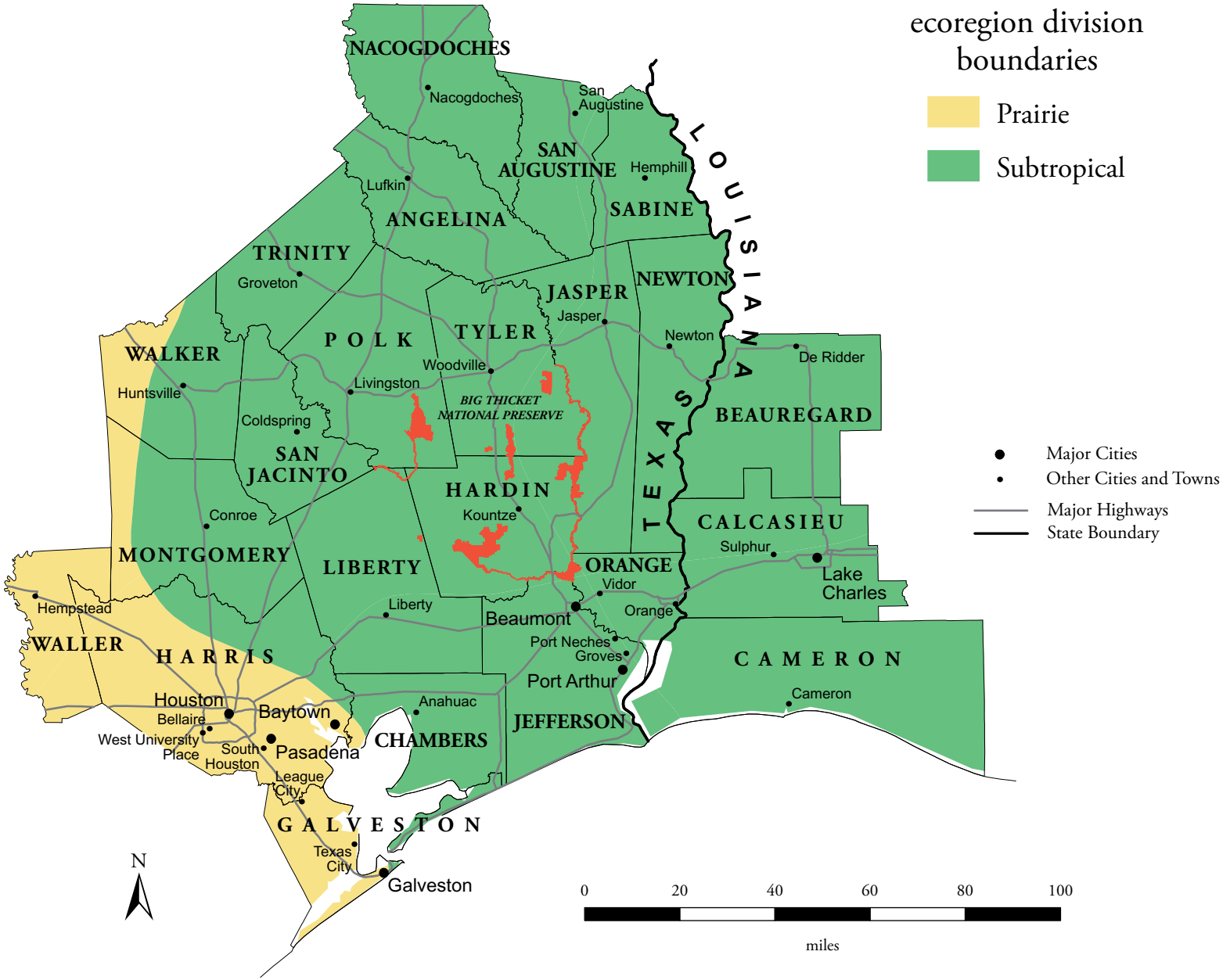
Ecoregions are ecosystems of regional extent, differentiated according to a hierarchical scheme that uses climate and vegetation as indicators of the extent of each unit. Robert Bailey of the U.S. Forest Service, U.S. Department of Agriculture, developed one system of ecoregional classifications (Bailey, R.G. 1995. *Description of the Ecoregions of the United States,* 2nd edition, Misc. Pub. No. 1391).

Descriptions of the two ecoregions that overlay the Big Thicket NPRES region are as follows:

Prairie – climate is characterized as subhumid. Precipitation may range from 20-40 inches per year; however, evapotranspiration is high. Soil moisture in upland areas is insufficient to support tree growth. Tall grasses and broad-leaved herbs dominate prairie vegetation. Trees and shrubs are rare, and typically found in patches that grow in valleys or other low-lying areas.

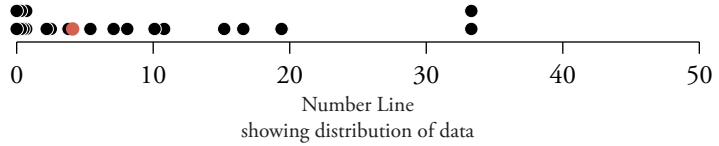
Subtropical – climate includes hot summers with high humidity and mild winters. However, frost occurs nearly every winter. Precipitation is distributed throughout the year, with a peak occurring during early spring or midsummer in the form of thunderstorms. Summer droughts can occur. Snow falls rarely and melts almost immediately. The forest is typically composed of broadleaf deciduous and needleleaf evergreen trees.

Ecoregions


ecoregion division boundaries
Prairie
Subtropical
NACOGDOCHES
Nacogdoches
San Augustine
SAN AUGUSTINE
Hemphill
SABINE
Lufkin
ANGELINA
TRINITY
Groveton
JASPER
Jasper
NEWTON
Newton
POLK
TYLER
WALKER
Woodville
Livingston
Huntsville
BIG THICKET NATIONAL PRESERVE
Coldspring
SAN JACINTO
HARDIN
Kountze
Conroe
MONTGOMERY
LIBERTY
Liberty
Hempstead
WALLER
HARRIS
Houston
Bellaire
West University Place
South Houston
Pasadena
Baytown
Anahuac
CHAMBERS
League City
GALVESTON
Texas City
Galveston
JEFFERSON
Beaumont
Port Neches
Groves
Port Arthur
ORANGE
Vidor
Orange
LOUISIANA
TEXAS
De Ridder
BEAUREGARD
CALCASIEU
Sulphur
Lake Charles
CAMERON
Cameron
Major Cities
Other Cities and Towns
Major Highways
State Boundary
N
0 20 40 60 80 100
miles

Federal Land Management

One indicator of the federal government's role in regional resource management is the amount of land under federal management. This amount can be measured as a percentage of the total land area in each county. Stewardship of private land is carried out through a combination of regulation, market forces, and voluntary action. In contrast, stewardship of public land is carried out through direct implementation of agency policies. Thus the variation in public versus private land ownership across the park region can significantly influence the design and implementation of resource protection strategies. Within the Big Thicket National Preserve region, land under federal management (2003) ranges from 0.0% (Cameron and Calcasieu) to 33.3% (Sabine and San Augustine).[17]



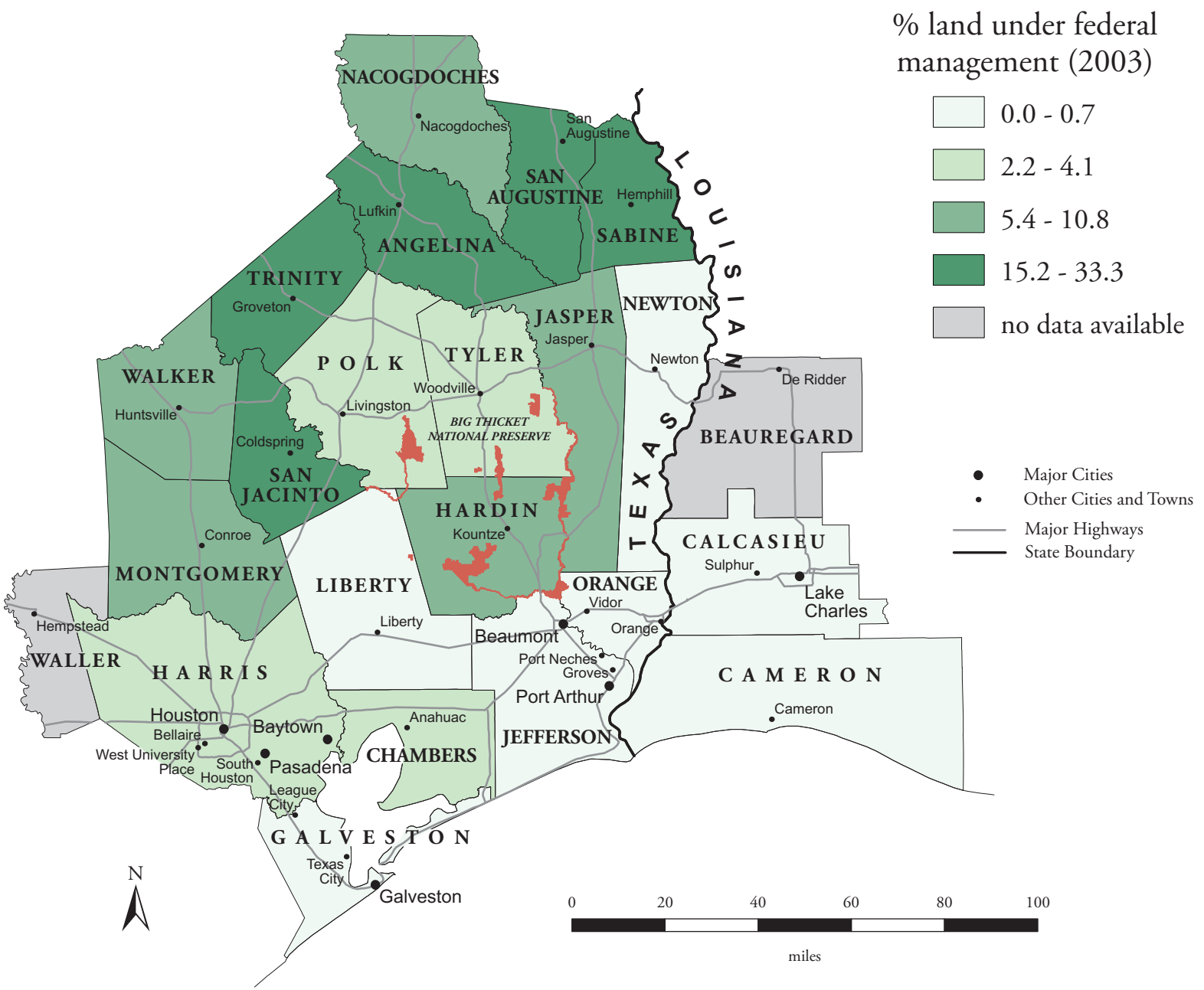
Number Line
showing distribution of data

% land under federal management (2003)

Cameron	0.0	Hardin	8.1
Calcasieu	0.0	Jasper	10.1
Newton	0.3	Walker	10.8
Jefferson	0.3	Trinity	15.2
Orange	0.5	San Jacinto	16.6
Galveston	0.7	Angelina	19.4
Liberty	0.7	Sabine	33.3
Harris	2.2	San Augustine	33.3
Polk	2.5	Beauregard	N/A
Tyler	3.8	Waller	N/A
Chambers	**4.1**		
Nacogdoches	5.4		
Montgomery	7.1		

National = 27.2
Texas = 1.6
Louisiana = 2.7

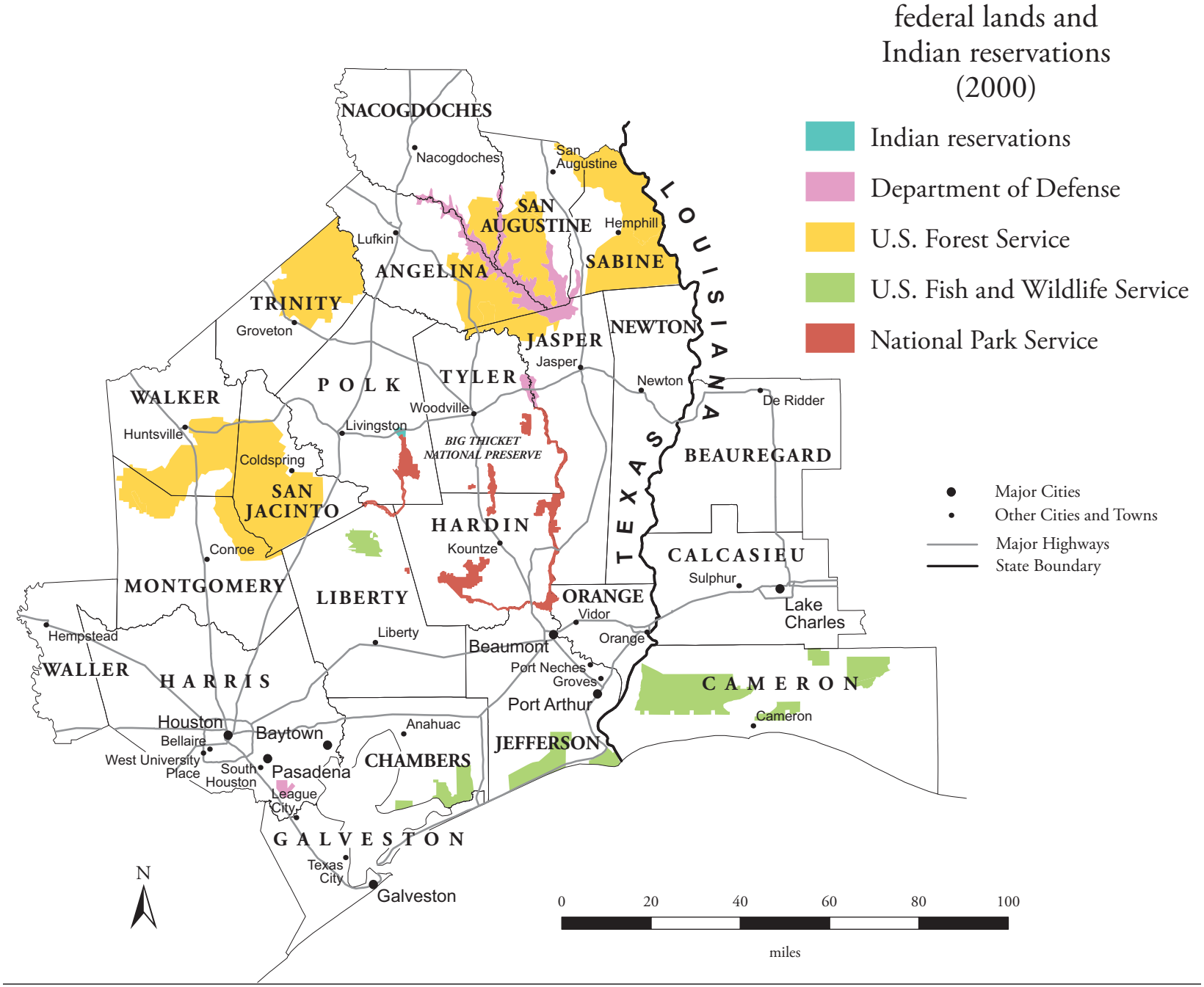
Federal Land Management



Federal Lands and Indian Reservations

National park units, administered by the National Park Service, are part of a larger system of public lands. Other federal agencies that administer public lands include the Bureau of Land Management, Bureau of Reclamation, Department of Defense, U.S. Fish and Wildlife Service, and U.S. Forest Service. Indian reservations are also an important part of the landscape. Public land managed by one federal agency may share boundaries with land managed by a different federal agency or with an Indian reservation. Understanding the location and pattern of federal lands (by agency) and Indian reservations can help park managers and others in the region cooperate on resource protection and planning issues.[18]

Federal Lands and Indian Reservations



Farmland

The relative importance of farming within a county can be indicated by the percentage of the county's total land area that is classified as farmland. Farming includes crop cultivation as well as pasturing and grazing of livestock. Because damaged or degraded natural resources present a long-term threat to the health and profitability of farming, farm operators are potentially key partners in local and regional resource protection issues. Park management can require close coordination with area farmers on many issues, such as control of non-native species, species reintroduction, preservation of scenic values, allocation of scarce water supplies, or management of agricultural runoff. Within the Big Thicket National Preserve region, the percentage of total county land area classified as farmland (1997) ranges from 10.7% (Newton) to 84.2% (Waller).[19]

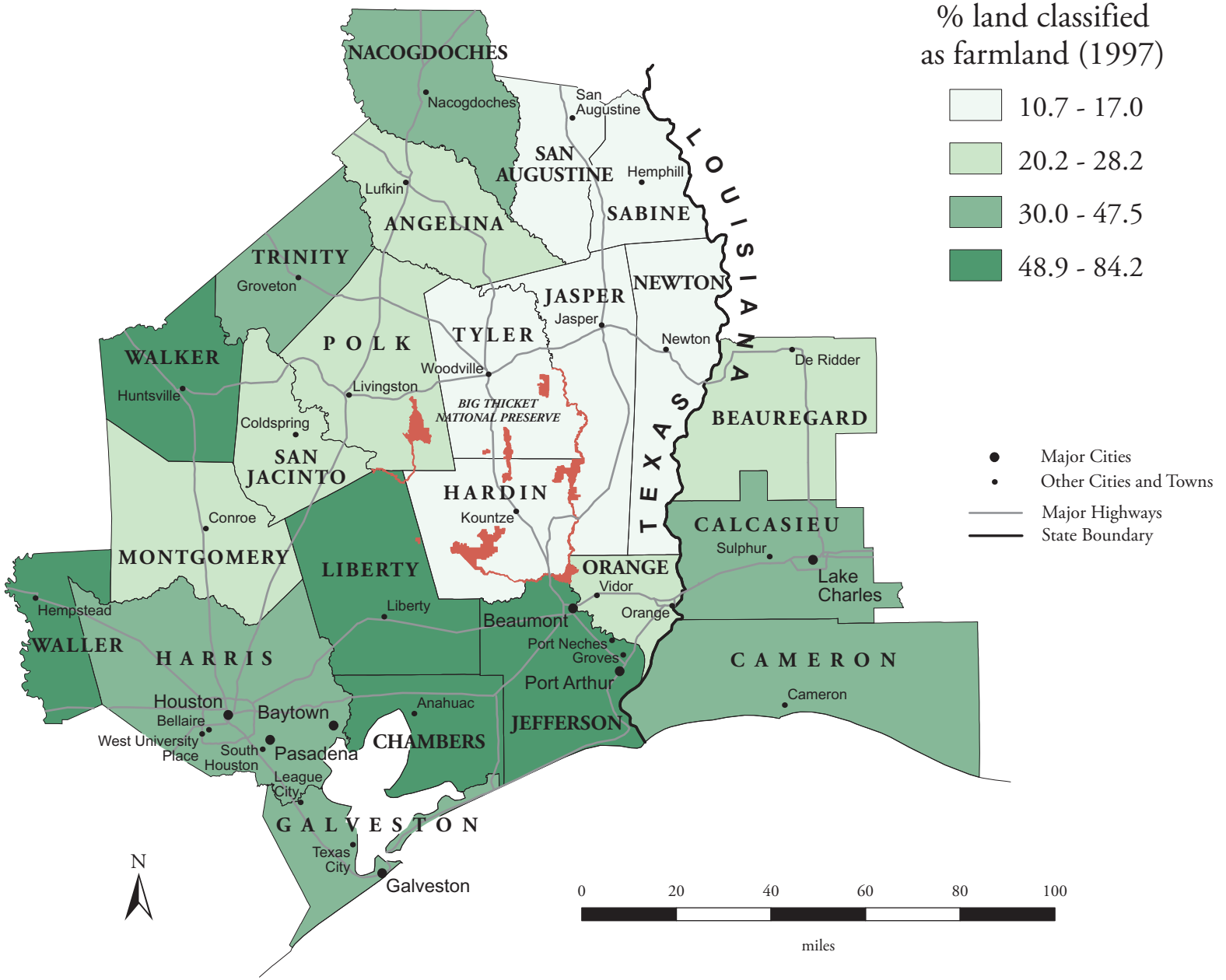
Number Line
showing distribution of data

% land classified as farmland (1997)

Newton	10.7	Cameron	30.4
Sabine	10.8	Harris	33.9
Hardin	11.2	Galveston	38.8
San Augustine	16.2	Nacogdoches	39.6
Tyler	16.4	Calcasieu	47.5
Jasper	17.0	Liberty	48.9
Angelina	20.2	Walker	53.5
Polk	21.3	Jefferson	53.9
Beauregard	21.5	Chambers	79.9
Orange	23.5	Waller	84.2
San Jacinto	25.0		
Montgomery	**28.2**		
Trinity	30.0		

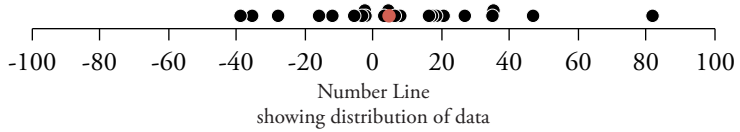
National = 41.2
Texas = 77.9
Louisiana = 28.7

Farmland


% land classified as farmland (1997)
10.7 - 17.0
20.2 - 28.2
30.0 - 47.5
48.9 - 84.2
Major Cities
Other Cities and Towns
Major Highways
State Boundary
NACOGDOCHES
Nacogdoches
San Augustine
SAN AUGUSTINE
Hemphill
Lufkin
ANGELINA
SABINE
LOUISIANA
TRINITY
Groveton
JASPER
Jasper
NEWTON
Newton
POLK
TYLER
Woodville
WALKER
Huntsville
Livingston
BIG THICKET NATIONAL PRESERVE
De Ridder
BEAUREGARD
Coldspring
SAN JACINTO
HARDIN
Kountze
TEXAS
Conroe
CALCASIEU
Sulphur
Lake Charles
MONTGOMERY
LIBERTY
ORANGE
Vidor
Hempstead
Liberty
Beaumont
Orange
WALLER
HARRIS
Port Neches
Groves
CAMERON
Port Arthur
Houston
Baytown
Anahuac
Cameron
Bellaire
JEFFERSON
West University Place
South Houston
Pasadena
CHAMBERS
League City
GALVESTON
Texas City
Galveston
N
0 20 40 60 80 100
miles

Change in Farmland

Changes in the amount of farmland provide an indication of economic and land use trends among counties in the park region. Land can be converted to farming because of increased demand for agricultural products or because new technology, business practices, or government programs make farming profitable. Land can be taken out of farming due to soil depletion, competition from growers elsewhere, loss of labor, or conversion of land to other (often urban) uses. Within the Big Thicket National Preserve region (1987 - 1997), the amount of farmland increased in 14 of 23 counties. The change ranged from a decrease of 39.0% (Orange) to an increase of 81.7% (Tyler).[20]



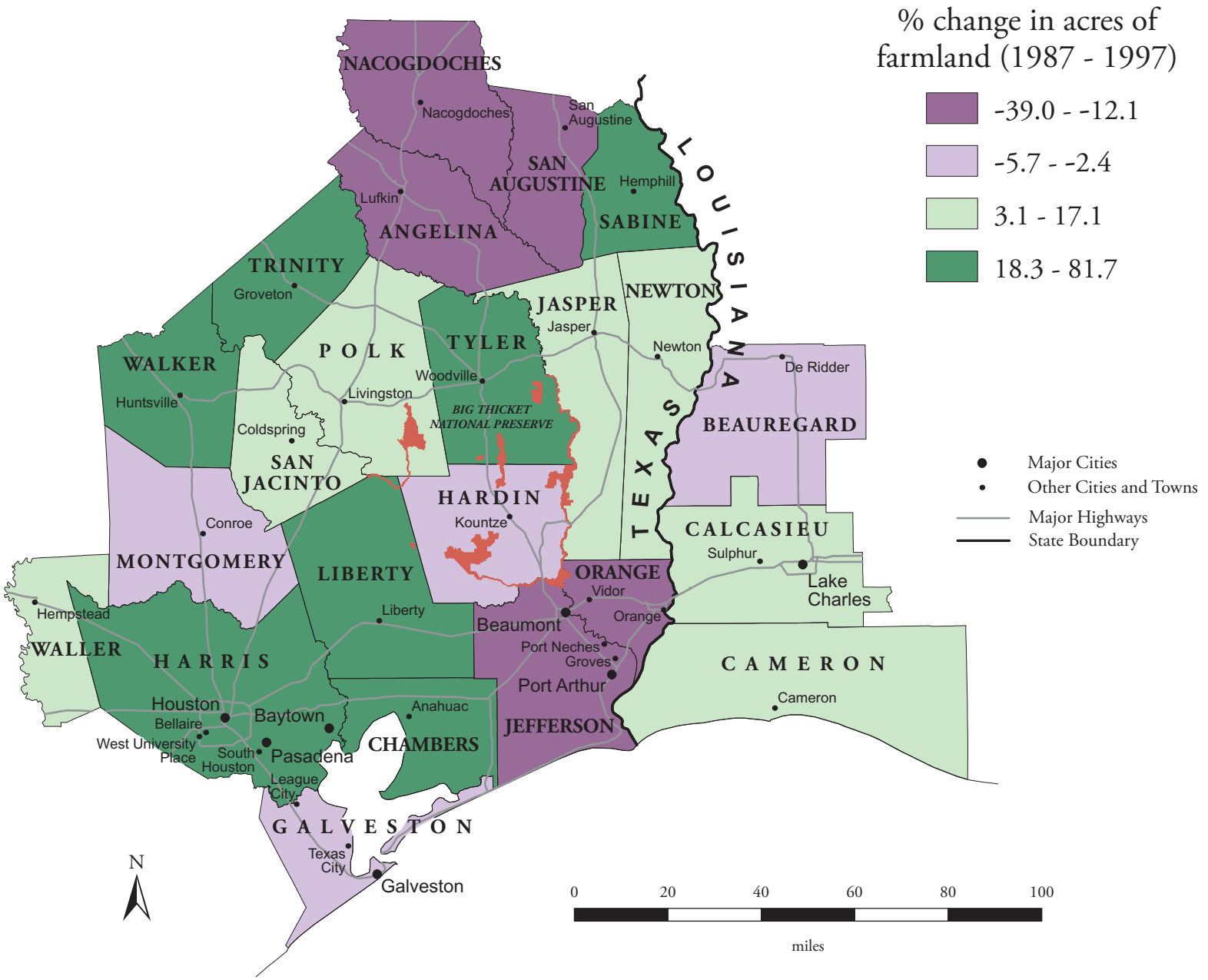
Number Line
showing distribution of data

% change in acres of farmland (1987 - 1997)

Orange	-39.0	San Jacinto	7.8
Nacogdoches	-35.6	Waller	16.2
Jefferson	-28.0	Jasper	17.1
San Augustine	-16.0	Liberty	18.3
Angelina	-12.1	Harris	20.5
Galveston	-5.7	Chambers	26.7
Beauregard	-3.4	Trinity	34.8
Montgomery	-2.6	Sabine	35.1
Hardin	-2.4	Walker	46.7
Newton	3.1	Tyler	81.7
Cameron	4.3		
Calcasieu	**4.5**		
Polk	6.2		

National = -3.4
Texas = -0.6
Louisiana = 1.7

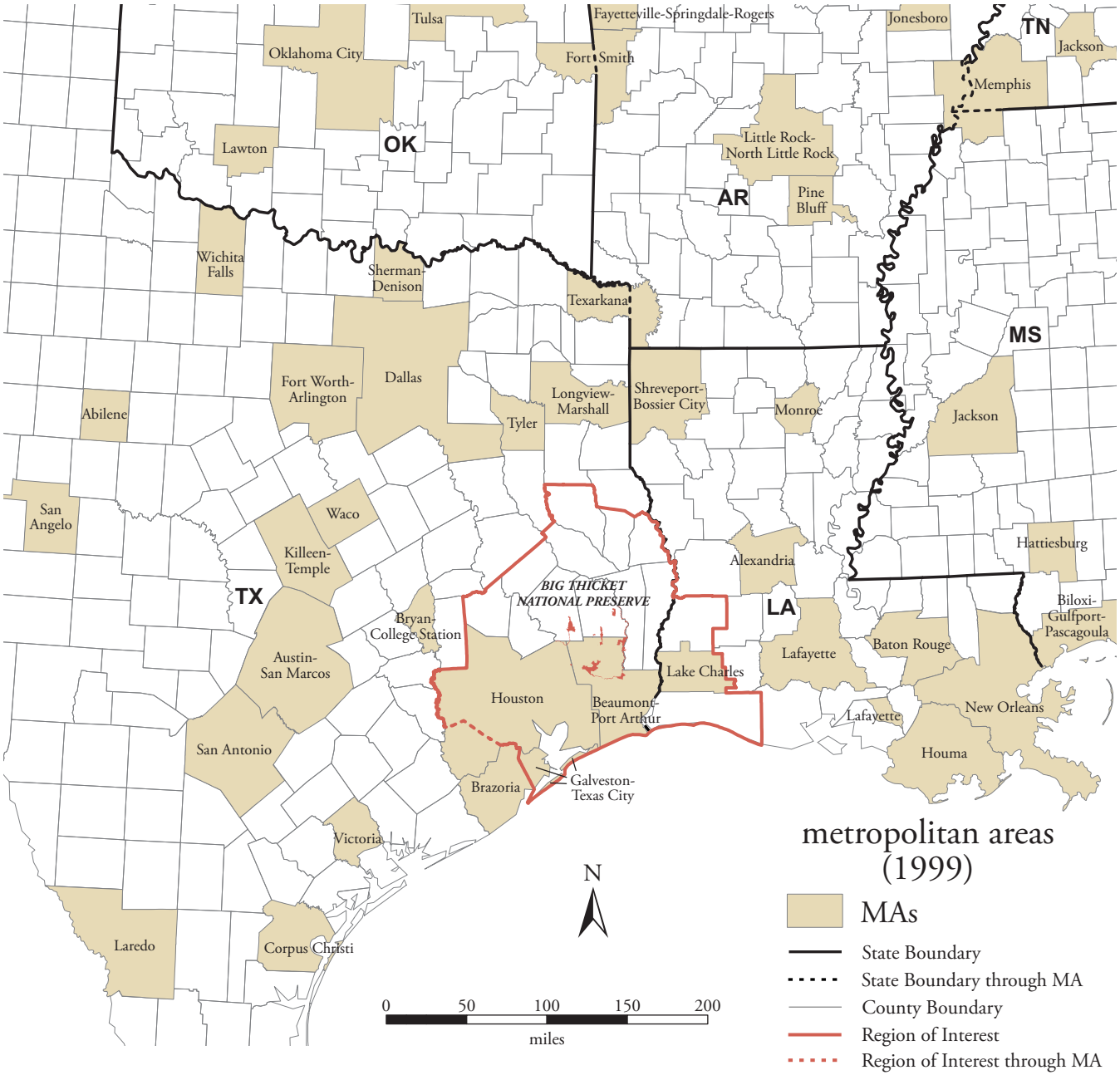
Change in Farmland



Metropolitan Areas

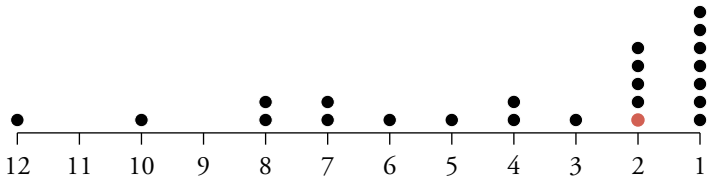
Maps of metropolitan areas show park managers densely populated urban areas that are near national park units. The Census Bureau defines a metropolitan area (MA) as having a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus. MAs are single counties or aggregations of counties. Most counties in MAs include both urban and rural land uses. For this map, a larger region around Big Thicket National Preserve is provided to show the extent of nearby MAs.[21]

Metropolitan Areas



Urbanization

Urbanization is a measure of the degree to which counties are associated with metropolitan areas based on population and commuting patterns. The political and economic priorities of more urbanized counties tend to differ from those of less urbanized counties. The concentration of people in towns, cities, and large metropolitan areas creates opportunities for cooperative efforts (such as municipal water systems, public transportation, and a host of non-governmental organizations) but also can increase the incidence of problems such as congestion, air pollution, and habitat fragmentation. The Economic Research Service classifies counties' degree of urbanization along a continuum ranging from completely rural (not near metro area and small population size) to large metropolitan. Within the Big Thicket National Preserve region (2003), 12 counties are classified as metropolitan.[22]

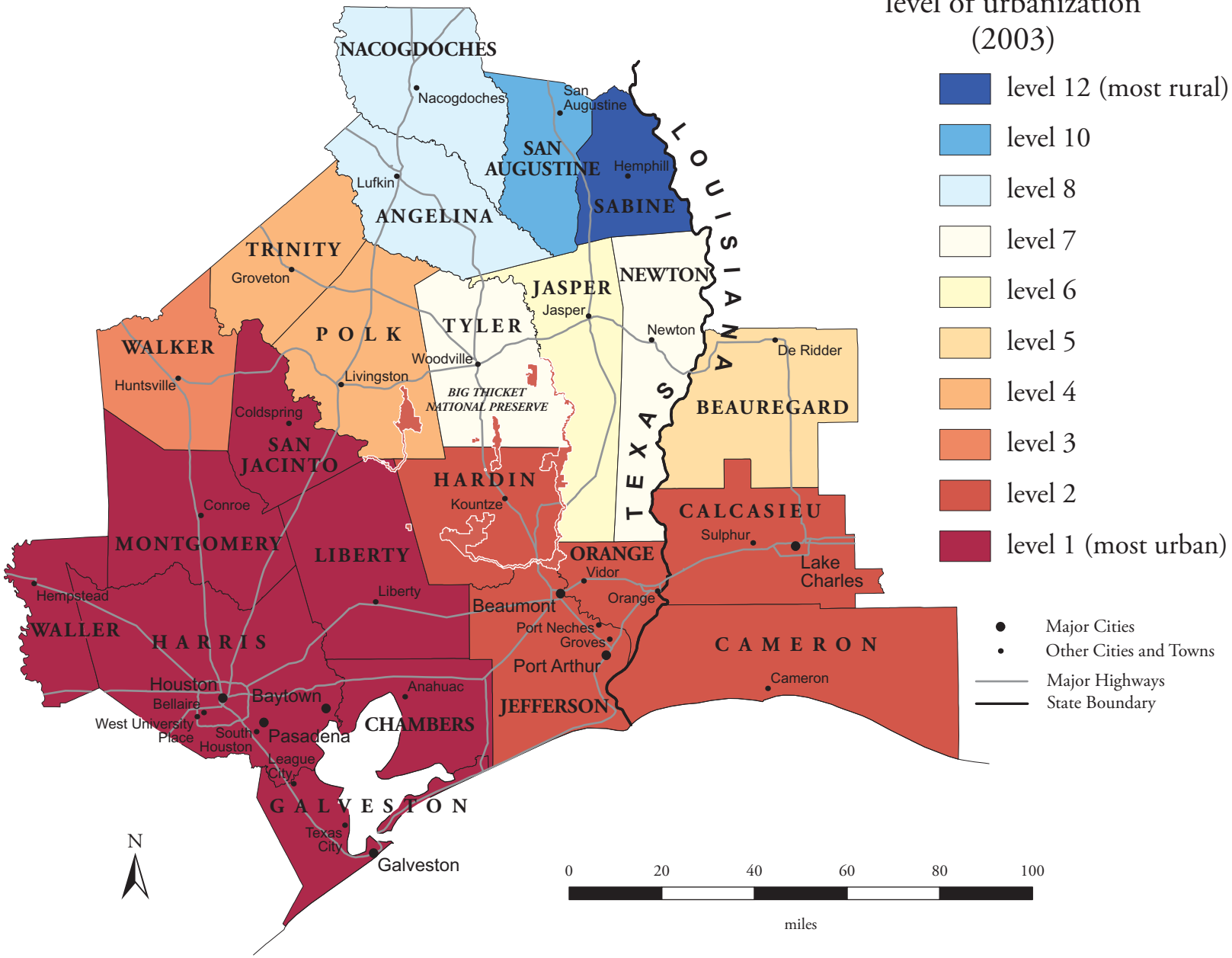


Number Line
showing distribution of data

level of urbanization
(2003)

Sabine	12	**Hardin**	**2**
San Augustine	10	**Jefferson**	**2**
Angelina	8	**Orange**	**2**
Nacogdoches	8	Chambers	1
Newton	7	Galveston	1
Tyler	7	Harris	1
Jasper	6	Liberty	1
Beauregard	5	Montgomery	1
Polk	4	San Jacinto	1
Trinity	4	Waller	1
Walker	3		
Calcasieu	**2**		
Cameron	**2**		

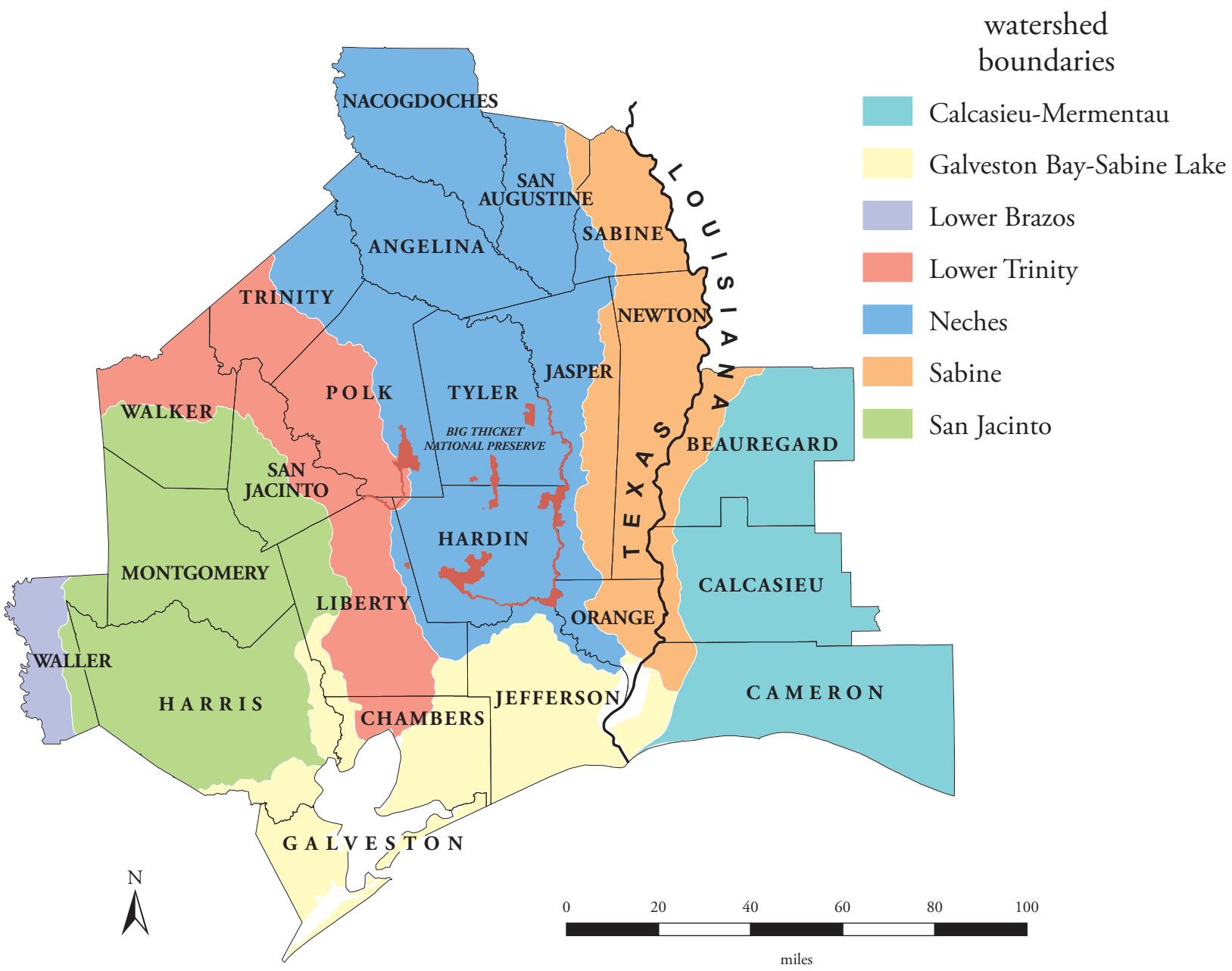
Urbanization



Watersheds

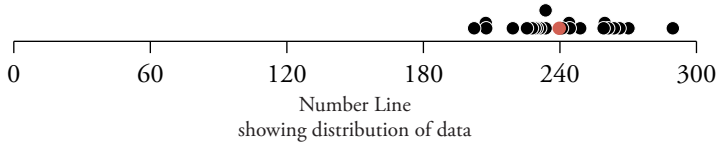
Watersheds are delineated by the U.S. Geological Survey using a nationwide system based on surface hydrological features. Watersheds are increasingly serving as the geographical units within which governments, institutions, and citizens organize to carry out initiatives for environmental protection and restoration. Familiarity with watershed boundaries is fundamental in developing educational programs and in mobilizing constituencies to protect water quality throughout the park region. The Big Thicket National Preserve region includes all or portions of seven basins.[23]

Watersheds


watershed boundaries
Calcasieu-Mermentau
Galveston Bay-Sabine Lake
Lower Brazos
Lower Trinity
Neches
Sabine
San Jacinto
NACOGDOCHES
SAN AUGUSTINE
SABINE
ANGELINA
TRINITY
NEWTON
JASPER
POLK
TYLER
WALKER
BIG THICKET NATIONAL PRESERVE
BEAUREGARD
SAN JACINTO
HARDIN
MONTGOMERY
LIBERTY
CALCASIEU
ORANGE
WALLER
HARRIS
JEFFERSON
CAMERON
CHAMBERS
GALVESTON
LOUISIANA
TEXAS
N
0 20 40 60 80 100
miles

Domestic Water Use

Domestic water use can be measured in gallons per day per person. The rate of domestic water consumption can be indicative of local consumption patterns, attitudes toward conservation, the cost of water, or the amount of regulatory control over water use. Higher rates of domestic water use may be associated with a more active tourism industry or with a greater prevalence of water-intensive landscaping, swimming pools, and so forth. Relatively low rates of domestic water use may indicate the presence of higher water costs or stricter water conservation guidelines. Among the counties of the Big Thicket National Preserve region, domestic water use per person (1995), ranges from 202.3 gallons/day (Calcasieu) to 289.6 gallons/day (Waller).



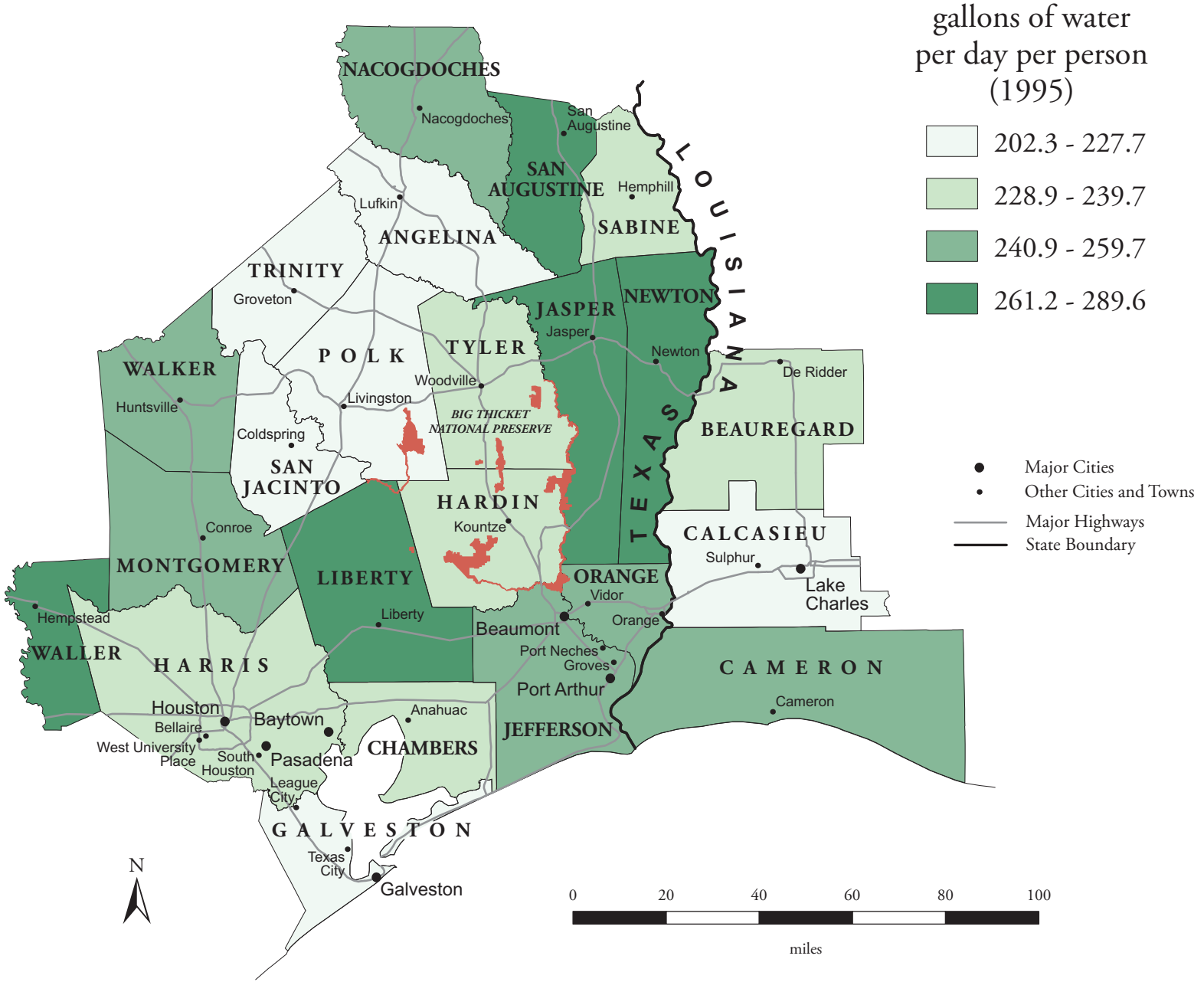
Number Line
showing distribution of data

gallons of water per day per person (1995)

Calcasieu	202.3	Montgomery	244.0
Polk	207.4	Nacogdoches	244.3
Angelina	207.6	Walker	248.9
San Jacinto	219.3	Cameron	259.2
Trinity	225.5	Orange	259.7
Galveston	227.7	Newton	261.2
Sabine	228.9	San Augustine	263.7
Tyler	229.8	Liberty	266.2
Beauregard	231.3	Jasper	270.1
Chambers	233.7	Waller	289.6
Hardin	233.7		
Harris	**239.7**		
Jefferson	240.9		

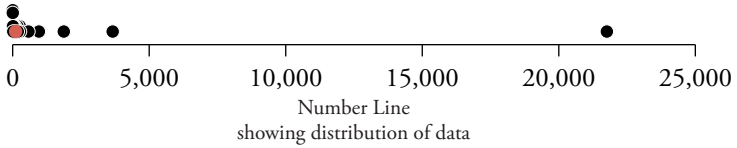
National = 181.9
Texas = 250.3
Louisiana = 200.7

Domestic Water Use



Building Permits

One indicator of growth in a local economy is the number of building permits issued for new privately-owned housing units. A greater number of building permits indicates demand for construction labor, supplies, and services. It indirectly implies that families are growing, retirees are moving to an area, or industries are moving and expanding economic output. Growth can generate new political priorities (such as greater demand for roads and schools) and can increase land values. Growth also alters the human impact within the ecosystem through effects such as increased water consumption, loss of cropland or habitat, or greater valuation of open space. Within the Big Thicket National Preserve region, the average number of building permits issued annually (1992 - 2002) ranges from 0 (Newton) to 21,760 (Harris).[24]



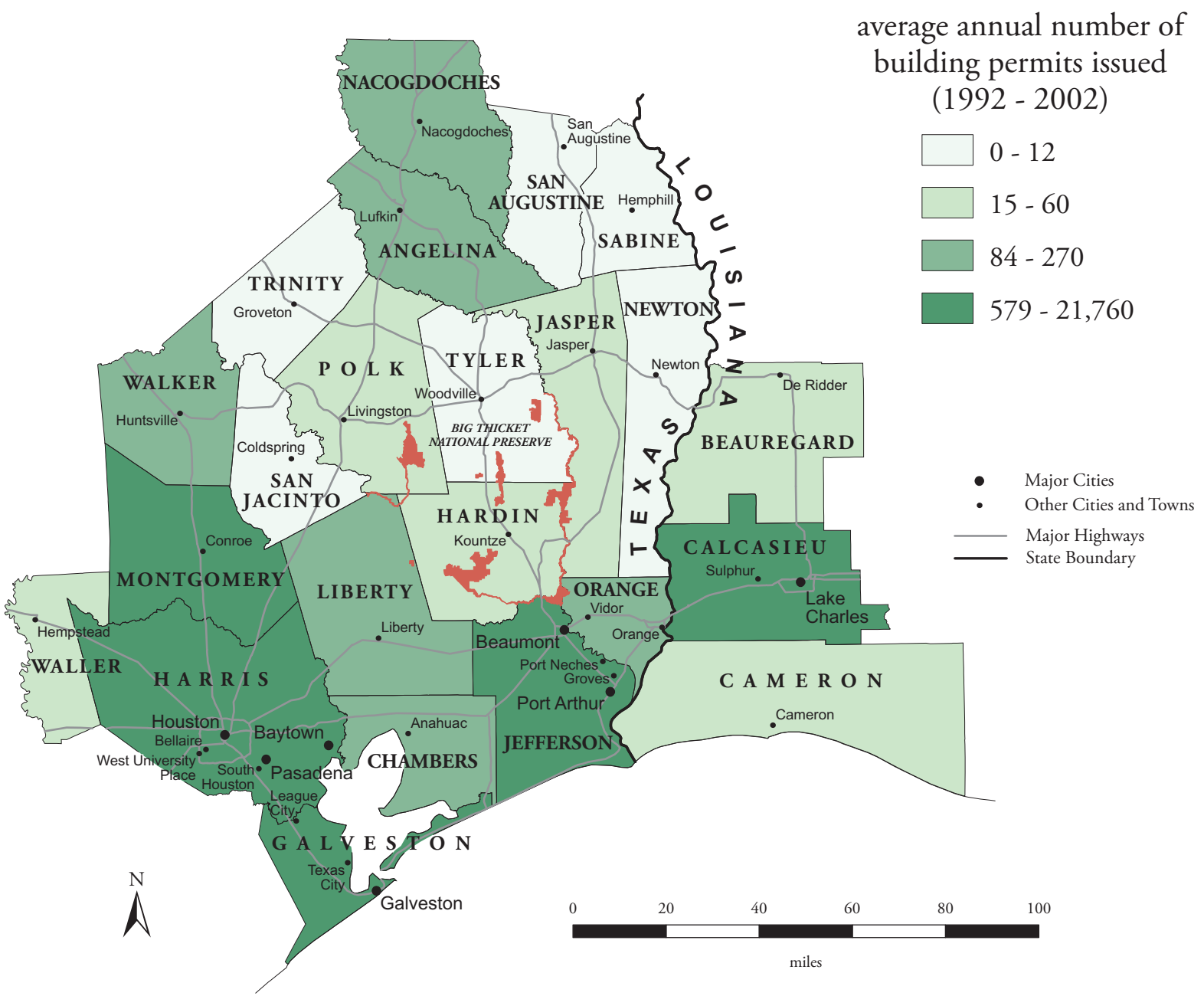
Number Line
showing distribution of data

average annual number of building permits issued (1992 - 2002)

Newton	0	Nacogdoches	109
Sabine	2	Chambers	172
San Augustine	2	Walker	187
San Jacinto	4	Liberty	260
Trinity	4	Orange	270
Tyler	12	Jefferson	579
Jasper	15	Calcasieu	960
Beauregard	22	Galveston	1,872
Hardin	29	Montgomery	3,663
Cameron	36	Harris	21,760
Polk	39		
Waller	**60**		
Angelina	84		

National = N/A
Texas = 117,807
Louisiana = 14,249

Building Permits



Conclusion: Using This Atlas for Park Management

A national park functions as part of a regional human ecosystem. A natural ecosystem can be understood in terms of factors such as flora, fauna, rainfall, temperature, elevation, and soil. Similarly, a human ecosystem can be understood in terms of factors such as population, commerce, social and cultural practices, politics, and land-use patterns.

The regional human ecosystem, like the natural ecosystem, strongly influences the long-term health of the park's natural and cultural resources. Just as a park may be concerned with upstream activities outside its boundaries yet inside its watershed, parks are also concerned with human activities taking place outside their boundaries yet inside their region. Thus, knowledge of natural and human conditions external to a park is as essential to park management as knowledge of internal natural and cultural conditions.

This atlas focuses on human activities and features in the region surrounding Big Thicket National Preserve. Five primary applications for this atlas as a tool for park management are:

- monitoring activities and analyzing trends that could have short- or long-term impacts on the park;
- making comparative studies, both within the region and between regions;
- assessing potential social impacts of management decisions;
- supporting collaborative decision-making and public participation; and
- educating park staff and other stakeholders about regional socioeconomic trends.

Monitoring activities and analyzing trends. The standardized data sources and presentation format of this atlas allow it to serve as a baseline for long-term monitoring of human conditions and trends that impact the park, such as immigration or economic shifts. These human conditions and trends can have significant implications for park planning and management. For example, the atlas can be consulted to determine trends in educational attainment among regional residents. This information could be helpful in designing interpretive and public participation programs and materials that can increase access to and understanding of the role of the park in the region. The atlas can be used to gain knowledge about the overall structure of and local variations in the regional economy. This information could be important to developing a strong collaborative working relationship with regional business leaders. The atlas can be examined to recognize trends in land use. This information could support proactive planning to mitigate potential impacts of development such as habitat fragmentation, degradation of air or water quality, or intrusions upon historic settings and/or scenic values.

Comparative studies. This atlas can support comparative studies of two kinds. First, the atlas can be used to compare counties within the region. By displaying the range of values for a particular indicator or a set of indicators, the atlas can help identify specific counties where it may be desirable to take (or avoid taking) certain management actions because of the potential impact on the human ecosystem. Second, the atlas can be used to make comparisons with other park regions. Potential management actions can be evaluated in terms of how effective they have been for another park unit where similar regional socioeconomic factors are involved.

Social impact assessment. Federal law and NPS planning directives require that park managers evaluate the social impacts of potential management actions. The socioeconomic indicators displayed in this atlas can make an important contribution to such social impact assessments. For example, the maps displayed here could be used to help understand the impacts of various park management plans and provide context for assessments at smaller scales, such as local communities.

Collaborative decision making. In developing general management plans, park staff are directed to "consider the park holistically … as part of the surrounding region" and to conduct planning "as part of cooperative regional planning whenever possible" (Director's Order 1998-2, par. 3.3.1.2). Tools such as this atlas can support the goal of applying a regional perspective to park planning and management. Distribution of this atlas to citizens, elected officials, educators, business and service groups, resource managers, and others can strengthen their ability to effectively participate in park management activities and decision-making. Maps that present facts in a standardized format can be particularly helpful for establishing common ground on which to decide upon management priorities, especially for decisions that affect both the park and the adjacent region.

Education and orientation. The atlas can be used to orient new park staff, as well as central office staff, to some of the basic facts about human activities in the park's region of interest. It can also serve as a tool for sharing information about socioeconomic trends with the public, gateway communities, media, and Congress.

In conclusion, effective park management requires a clear understanding of human activities in the surrounding region that can impact park resources and operations. By providing the "basic facts" about such activities, this atlas can help managers, citizens, and others better provide for the preservation and enjoyment of Big Thicket National Preserve.

Appendices

Appendix 1: Data Sources for Indicators

The data sources used to obtain the measures for the socioeconomic indicators are listed below. The indicators listed on the left correspond to the titles of the maps in the atlas. The measure corresponds to captions for the legends used in the maps and the ranked data.

INDICATOR	MEASURE	DATA SOURCE
General Population		
*Total Population	total number of people (2003)	U.S. Department of Commerce, Census Bureau, http://eire.census.gov/popest/estimates_dataset.php
*Recent Population Change	% change in total number of people (1990 - 2000)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/cen2000/atlas/all_00.xls
*Projected Population Change	projected % change in total number of people (2000 - 2020)	Woods & Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
Population Density	average number of people per square mile (2000)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/cen2000/atlas/all_00.xls
Population Density Change	% change in average number of people per square mile (1980 - 2000)	1) U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://censtats.census.gov/cgi-bin/usac/usasel.pl *(1980 population density)* 2) U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/cen2000/atlas/all_00.xls *(2000 population density)*
Projected Population Density	projected average number of people per square mile (2020)	1) U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/cen2000/atlas/all_00.xls *(county square mile data)* 2) Woods & Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com *(2020 projected population)*

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Median Age	median age of total population (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 1 (SF1) 100% Data, Table P13
Elderly Population	% total population 65 years old and over (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 1 (SF1) 100% Data, Table P12
Economy and Commerce		
*Earnings by Industry	% total earnings by industrial category (1999)	Woods & Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
Projected Change in Earnings by Industry	projected % change in total earnings by industrial category (2000 - 2020)	Woods & Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
*Employment by Industry	% employment by industrial category (1999)	Woods & Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
*Poverty	% total population in poverty (1999)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/hhes/poverty/2000census/poppvstat00.html
Median Household Income	median household income ($) (1999)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 3 (SF3) Sample Data, Table P53

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Social and Cultural Characteristics		
Racial and Ethnic Composition	% total population in each racial/ethnic category (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 1 (SF1) 100% Data, Tables P7, P8
*Racial Diversity	% total population belonging to minority race groups (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 1 (SF1) 100% Data, Table P7
*Educational Attainment	% total population 25 years old and over with some college or college degree (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov – Census 2000 Summary File 3 (SF3) Sample Data, Table P37
Spanish Speakers	% total population 5 years old and over that speak primarily Spanish at home (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov -- Census 2000 Summary File 3 (SF3) Sample Data,Table PCT-10
Recreation and Tourism		
Recreation/Tourism Establishments	% of total establishments in arts, entertainment, recreation, and accommodation services (2001)	U.S. Department of Commerce, Census Bureau, http://censtats.census.gov/cbpnaic/cbpnaic.shtml
*Recreation/Tourism Employment	% of total paid employees in arts, entertainment, recreation, and accommodation services (2001)	U.S. Department of Commerce, Census Bureau, http://censtats.census.gov/cbpnaic/cbpnaic.shtml
*Recreation/Tourism Revenue	% of total sales from arts, entertainment, recreation, and accommodation services (1997)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/epcd/www/econ97.html
Administration and Government		
*Congressional Districts	Congressional Districts (2000)	U.S. Department of the Interior, U.S. Geological Survey, http://nationalatlas.gov/cgd108m.html
*Federal Expenditures	federal expenditures per capita ($) (2002)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/prod/www/abs/cffr.html

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Land Use		
Ecoregions	ecoregion division boundaries	1) USDA Forest Service, Inventory and Monitoring Institute, http://www.fs.fed.us/institute/ecoregions/eco_download.html 2) Bailey, Robert G. (1995). *Description of the Ecoregions of the United States* (2nd ed.). Misc. Pub. No. 1391, USDA Forest Service, 108 pp.
*Federal Land Management	% land under federal management (2003)	1) U.S. Department of the Interior, Bureau of Land Management. Payment in Lieu of Taxes, Fiscal Year 2003. Washington, DC. http://www.blm.gov/pilt/search.html *(federal land in acres)* 2) U.S. Department of Commerce, Census Bureau http://www.census.gov/population/cen2000/atlas/all_00.xls *(county square mile data to convert into acres)*
*Federal Lands and Indian Reservations	federal lands and Indian reservations (2000)	U.S. Department of the Interior, U.S. Geological Survey, http://nationalatlas.gov/atlasftp.html
Farmland	% land classified as farmland (1997)	U.S. Department of Agriculture, National Agricultural Statistics Service, http://www.nass.usda.gov/census/
*Change in Farmland	% change in acres of farmland (1987 - 1997)	U.S. Department of Agriculture, National Agricultural Statistics Service, http://www.nass.usda.gov/census/
*Metropolitan Areas	metropolitan areas (1999)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/geo/www/cob/ma1999.html#shp
*Urbanization	level of urbanization (2003)	U.S. Department of Agriculture, Economic Research Service, http://www.ers.usda.gov/Data/UrbanInfluenceCodes/
Watersheds	watershed boundaries	U.S. Department of the Interior, U.S. Geological Survey, http://www.nationalatlas.gov/hucsm.html
Domestic Water Use	gallons of water per day per person (1995)	U.S. Department of the Interior, U.S. Geological Survey, http://water.usgs.gov/watuse/spread95/usco95.txt

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Building Permits	average annual number of building permits issued (1992 - 2002)	U.S. Department of Commerce, Census Bureau, Manufacturing and Construction Division, http://www.census.gov/const/www/permitsindex.html

** Denotes a core indicator, common to all atlases in this series. Additional indicators were selected by park managers to include information specific to their particular management needs.*

Appendix 2: Technical Notes on Map Design

Selection of Base Map Data – The regional base map used to map socioeconomic indicators in this atlas includes state and county boundaries, some of the major roads, major cities, and a few other selected cities and towns. The roads, cities, and towns are included to provide readers with a few familiar points of reference. It should be emphasized that this is not a general purpose atlas of the region, for it focuses only on socioeconomic indicators.

Choropleth Mapping – For most of the maps, data are grouped by quartiles which vary in shading from light to dark (for low to high values). This shading technique, known as choropleth mapping, is usually applied to ratio data; population density, infant deaths per 1,000 live births, and median income are examples. Maps that display total amounts (such as total population) often use other approaches, such as proportional symbols. For clarity, ease of use, and consistent design, choropleth mapping is used for most of the social indicator data.

Quartile Classification – The choice of a *quartile* classification of the data means that for most maps, counties were divided into four classes. Rather than focusing on the actual numerical value of the indicator for each county, the quartile approach emphasizes rankings of data values among counties. The legend accompanying the map allows the reader to see the range of values among counties within a class. Quartiles make it easy for the reader to make intuitive comparisons among counties; the darkest shaded counties are in the "top quarter," the lightest shaded counties are in the "bottom quarter," and so forth. Quartiles also facilitate comparisons between maps in the atlas ("this county ranks in the bottom quartile on all three of these indicators").

Two notes: (1) Whenever the number of counties cannot be evenly divided by four, the convention for this atlas series is to reduce the size of the highest quartile first, then the next quartile if needed, then the third quartile if needed. Hence eleven counties would be divided into groups of 3, 3, 3, and 2, with the group of 2 having the highest data values/darkest shading. (2) Counties with identical data values are grouped in the same quartile, even if this results in quartiles of unequal size.

Note on Political Boundaries – The regional base map depicts the formally defined political boundaries of states and counties.

Map Sources – The regional map on the cover and at the beginning of the atlas was generated from the North American HYDRO1k dataset (http://edcdaac.usgs.gov/gtopo30/hydro/) developed at the U.S. Geological Survey's EROS Data Center. The standard region of interest map used throughout the atlas was generated from U.S. Geological Survey shapefiles. Contextual information (roads and cities) was also obtained from the U.S. Geological Survey (http://www.nationalatlas.gov).

Production – Indicator data for the atlas were compiled in Microsoft Excel 2000. These were linked to U.S. Geological Survey shapefiles using ESRI ArcMap GIS 8.3. The GIS files were imported into Adobe Illustrator 10.0 for final map

design. Text was prepared in Microsoft Word 2000. The final atlas layout (text, maps, graphics) was completed using Adobe InDesign 2.0.

Text Sources – Additional web resources used to prepare park and regional descriptions are:

- Big Thicket National Preserve;
  http://www.nps.gov/bith/index.htm
- County and City Data Book – 2000;
  http://www.census.gov/prod/www/ccdb.html
- Partnership of Southeast Texas;
  http://www.setx.org/
- Texas A&M University, Big Thicket National Preserve, Virtual Field Trip;
  http://geoexplorer.tamu.edu/bigthicket/index.html
- Timeline, East Texas History;
  http://www.wwits.net/history/timeline.phtml
- Handbook of Texas Online;
  http://www.tsha.utexas.edu/handbook/online/articles/view/AA/bma19.html

Appendix 3: Technical Notes on Measurement of Selected Indicators

[1] Persons enumerated in the census were counted as inhabitants of their usual place of residence, which generally means the place where a person lives and sleeps most of the time. This place is not necessarily the same as the legal residence, voting residence, or domicile. In the vast majority of cases, however, the use of these different bases of classification would produce substantially the same statistics, although appreciable differences may exist for a few areas.

[2] For an explanation of Woods & Poole's projection methods see page 11 in the Woods and Poole Technical Documentation manual.

[3] **Population density** is measured as the average number of people per square mile. This number is calculated by dividing the total number of people by the total area per county. In counties with federal lands, excluding these areas from the calculation of population density would result in a higher population density.

[4] See note above on population density.

[5] See note above on population density.

[6] Economic activity is categorized as belonging to one of four **industry categories**: agriculture/natural resources, construction/manufacturing, sales/services, and government. Individual workers, regardless of their specific job

responsibilities, are classified according to the category their overall company or organization belongs to. Thus, while accounting is considered a "service" activity, an accountant for a mining company would be counted as working in "agriculture/natural resources." "Government" includes all federal government workers and all state/local employees, such as teachers, police, firefighters, etc. Even though government jobs may involve construction, natural resource management, or provision of services, they are still counted as belonging to the "government" category.

[7] See note above on industry categories.

[8] See note above on industry categories.

[9] **Poverty** is measured as the percentage of the total population living below the poverty level. The poverty level is defined as earnings of $17,029 or less for a family of four persons (1999). Poverty thresholds are applied on a national basis and are not adjusted for regional, state, or local variations in the cost of living.

[10] **Racial composition** is based upon self-identification by people responding to the U.S. Census. Census respondents are asked to classify themselves according to the race with which they most closely identify. Specific responses such as "Polish," "Haitian," "Thai," or "Lakota" were coded more generally as belonging to one of six general categories (White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and Some Other Race respectively). Respondents to Census 2000 could indicate more than one race, and these respondents are grouped together in the category Two or More Races. Persons of Hispanic or Latino origin may be of any race. People of Hispanic origin who are not white were counted in the Hispanic group and were also counted in the Black, American Indian and Alaska Native, Asian, or Native Hawaiian or Other Pacific Islander group they indicated.

[11] **Racial diversity** is defined for this measure as the percentage of the population classified as being non-White. Diversity by this definition does not necessarily measure the degree of "variety" in the population. For example, a hypothetical county with a 90% Asian population would be considered more "diverse" than a county in which each of the six major race groups constituted 10% of the population (in the latter case, diversity would be measured as 60%). The Hispanic or Latino origin category was not included in this measure because persons of Hispanic or Latino origin may be of any race (including White). Data on the Hispanic population are included on pages 38 and 39.

[12] For the census, persons are classified according to the highest level of school completed or the highest degree received.

[13] **Recreation and Tourism** is composed of the arts, entertainment, and recreation sector and the accommodation subsector, both a part of The North American Industry Classification System (NAICS). The arts, entertainment, and recreation sector includes museums, historical sites, gambling and recreation industries, golf courses and country clubs, fitness and recreational sports centers, and all other amusement industries. The accommodation subsector is

comprised of establishments including hotels, motels, bed and breakfasts, RV parks, recreational camps, and vacation camps. For a complete definition of these NAICS categories please consult http://www.census.gov/epcd/www/naics.html.

[14] See note above on recreation/tourism.

[15] See note above on recreation/tourism.

[16] **Federal expenditures** include expenditures, or obligation for, direct payments for individuals, procurement, grants, salaries and wages, direct loans, and guaranteed loans and insurance. Grant awards are reported by county of the initial recipient; thus if the initial recipient is the state government, the county in which the state capital is located is reported as having "received" that "pass-through" grant, even though the monies are subsequently distributed to other local governments.

[17] **Federal lands** include all tax-exempt federal lands administered by the Bureau of Land Management (BLM), the National Park Service, the U.S. Fish and Wildlife Service, the U.S. Forest Service, federal water projects, and some military installations (tribal lands are not included). The BLM calculates the amount of federal land within counties in order to administer the federal government's payments-in-lieu-of-taxes (PILT) program.

[18] The U.S. Geological Survey produces the **Federal Lands and Indian Reservations** map layer. This map layer does not include any federally and Indian held land that has an areal extent smaller than 640 acres. For more information and metadata, consult http://www.nationalatlas.gov/fedlandsm.html.

[19] **Farmland** consists primarily of agricultural land used for crops, pasture, or grazing. Also included are woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator's total operation. Farmland includes acres in the Conservation Reserve, Wetlands Reserve Programs, or other governmental programs. Farmland includes land owned and operated as well as land rented from others. Land used rent-free is included as land rented from others. All grazing land, except land used under government permits on a per-head basis, is included as farmland provided it was part of a farm or ranch. Land under the exclusive use of a grazing association is reported by the grazing association and included as farmland. All land in American Indian reservations used for growing crops or grazing livestock is included as farmland. Land in reservations not reported by individual American Indians or non-Native Americans is reported in the name of the cooperative group that used the land.

[20] See note above on farmland.

[21] Certain **MAs** are defined around two or more nuclei. Each MA must contain either a place with a minimum population of 50,000 or a U.S. Census Bureau-defined urbanized area and a total MA population of at least 100,000. For a complete definition, consult http://www.census.gov/geo/www/cob/ma_metadata.html.

[22] The Economic Research Service classifies counties according to their level of urbanization. The classification consists of twelve mutually-exclusive codes:

METROPOLITAN COUNTIES

1) In large metro area of greater than 1 million residents
2) In small metro area of less than 1 million residents

NONMETROPOLITAN COUNTIES

3) Micropolitan adjacent to large metro
4) Noncore adjacent to large metro
5) Micropolitan adjacent to small metro
6) Noncore adjacent to small metro with own town
7) Noncore adjacent to small metro no own town
8) Micropolitan not adjacent to a metro area
9) Noncore adjacent to micro with own town
10) Noncore adjacent to micro with no own town
11) Noncore not adjacent to metro or micro with own town
12) Noncore not adjacent to metro or micro with no own town

[23] **Watersheds** are delineated by the U.S. Geological Survey using a nationwide system based on surface hydrologic features and published in 1998. This system divides the country into 21 regions, 222 subregions, 352 accounting units, and 2,262 cataloging units. A hierarchical hydrologic code (HUC) consisting of 2 digits for each level in the hydrologic unit system is used to identify any hydrologic area. The 6-digit accounting units and 8-digit cataloging units are generally referred to as basin and sub-basin. Watersheds for this atlas are the 6-digit cataloging unit. The EPA uses this as its definition of watershed (see http://www.epa.gov/surf/watershed.html).

[24] The issuing of **building permits** for privately-owned housing units does not necessarily imply that a community is growing, since any community will experience an ongoing replacement of aging houses and buildings. Also, a catastrophic event such as a major storm or fire can generate a short-term surge in the number of building permits issued. Thus a better indicator of growth is an average of annual numbers of building permits issued over a ten-year period. Changes in local codes or enforcement can also affect the number of building permits issued. This measure includes data about new housing units intended for occupancy and maintained by the occupants. It excludes hotels, motels, and group residential structures such as nursing homes and college dormitories. All public housing and nonresidential buildings are also excluded. For a complete definition see http://www.census.gov/ftp/pub/const/www/newresconstdoc.html.

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